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Drag Coefficient and Movement Phenomena of Free-rising Spherical Particles

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Abstract

Light particles are commonly utilized as the solid phase in reverse fluidized bed reactors, especially for applications in wastewater treatment and other chemical or biochemical processes. This is primarily due to their favorable buoyancy characteristics and their ability to enhance mass transfer and mixing within the reactor. The drag coefficient related to the particle terminal velocity is one of the vital parameters for fluidized bed operation and design. However, traditional drag coefficient models are mostly based on heavy particle settling experiments. The few free-rising particle experiments have only justified the constant drag coefficient values in the high Reynolds number region, but the drag coefficient predictions for the low Reynolds number region have been assumed to be the same as for heavy particles.

Thus, this study investigates the drag coefficient and movement phenomena of free-rising spherical particles in various fluid mediums. It focuses on understanding the complex interactions between spherical particles and fluid dynamics, particularly under different conditions of density differences and fluid types. The research encompasses experimental setups using spherical particles of various materials and sizes in fresh and salted water. High-speed video imaging and advanced tracking software were employed to analyze the particles' terminal velocities and movement behaviors. A new drag coefficient model for free-rising spherical particles was developed, offering improved accuracy over traditional models, especially at lower Reynolds numbers. The study's findings provide valuable insights into particle-fluid interactions, which have significant implications for fluidization technology and related industrial applications.

Keywords

Free-rising Particles, High-speed video particle tracking imaging and analysis, Drag Coefficient, Drag Coefficient Model, Movement of Free-rising Spheres, Density Difference.

Summary for Lay Audience

In many industrial processes, including wastewater treatment and chemical manufacturing, special reactors called reverse fluidized bed reactors are used. These reactors contain suspended light particles that float downwards with the fluid direction down to the bottom of reactor through the liquid inside the reactor. The light particles help to enhance mass transfer and mixing within the reactor and make the treatment process more efficient.

One key aspect of designing these reactors is understanding how these particles move through the liquid, especially their speed as they rise, which is influenced by a factor called the drag coefficient. This drag coefficient helps engineers predict how particles will behave in different liquids.

Traditional models to predict this drag coefficient are based on experiments with heavy particles sinking in liquids. However, light particles, which float upwards, behave differently. Previous studies have shown that the drag coefficient for light particles in high Reynolds number conditions has similar tendence to that for heavy particles, but larger constant drag coefficient value. There has been little research on how this coefficient behaves at low Reynolds number for free-rising particles, which are more common in these reactors.

This research focuses on understanding how spherical light particles move through various liquids, such as fresh water and saltwater, under different conditions. By using advanced video technology and tracking software, the study observed and measured the movement and the speeds of these particles in great detail. The findings led to the development of a new model for predicting the drag coefficient of light particles, especially at low Reynolds number region. This new model is more accurate than traditional ones and can help improve the design and efficiency of fluidized bed reactors, benefiting industries that rely on these systems.

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Nomenclature

ρ_p	Particle density, kg/m^3
ρ_f	Fluid medium density, kg/m^3
μ	Fluid medium viscosity, $Pa \cdot s$
u_T	Particle terminal velocity, m/s
d_p	Particle mean diameter, mm
D	Geometric Cross-diameter, mm
g	Gravitational Acceleration, m/s^2
F_{Drag}	Drag Force, N
$F_{Buoyancy}$	Buoyancy Force, N
$F_{Gravity}$	Gravity Force, N
C_d	Drag coefficient
Re	Reynolds Number
Re_T	Terminal Reynolds Number
Ar	Archimedes Number
$\Delta\rho$	Density difference, kg/m^3
dt	Time interval, s
x	Horizontal direction
y	Vertical direction
v_x	Particle velocity in horizontal direction, m/s
v_y	Particle velocity in vertical direction, m/s

Nomenclature

ψ_p	Particle sphericity	$\bar{\rho}$	Density difference ratio
σ	Standard deviation		

Abbreviation

PP	Polypropylene	WD	Wood
PMMA	Polymethyl methacrylate	FW	Fesh Water
EPS	Expanded Polystyrene	SW	Salted Water

Chapter 1 General Introduction and literature review

1.1 Background

Fluidized bed reactors are a type of chemical reactor based on particle technology widely used in various industrial processes, including petrol refining, mineral processing, wastewater treatment processing, etc. (Zhu and Chen, 2005). In these reactors, solid particles are suspended and converted from static solid state to a dynamic liquid like state by a flowing fluid, such as gas or liquid (Wilhelm and Kwauk, 1948). Through the fluidization of the solid particles, the system can be distinctly benefited from the aspects of the high fluid-solid contact quality, the advanced heat and mass transfer capacities (Lim et al., 1995). Thus, the movement and behavior of these particles within the fluidized bed are crucial for the efficiency and effectiveness of the reactor.

Traditional fluidized bed reactors often use heavy particles, but inverse fluidized bed reactors employ light particles due to their unique properties (Wang et al., 2020; Nan and Zhu, 2022). Light particles, with their favorable buoyancy characteristics, enhance mass transfer and mixing within the reactor, making them particularly suitable for applications where efficient mixing and contact between the phases are essential.

1.2 Drag coefficient

The concept of drag and the drag coefficient dates back to the early studies of fluid dynamics by Sir Isaac Newton in the 17th century. Newton's work on resistance laws laid the groundwork for the development of more detailed theories on drag forces. In the early 20th century, further advanced the understanding of drag through their contributions to boundary layer theory and turbulence.

Whenever there is a difference in motion between an individual particle and fluid surrounding it, the body of the particle experiences drag from the fluid. The drag force is the surface integral of all normal and shearing stresses acting on the particle. The related drag coefficient of particles is a critical parameter in fluid dynamics, characterizing the resistance experienced by a particle as it moves through a fluid. The drag coefficient, C_d, is defined in terms of the drag force per unit project, i.e., the area of a circle of the same diameter as the sphere. For incompressible fluids where only friction and inertia are present, the drag coefficient depends only on the dimensionless terminal Reynolds number Re_T.

The related fluid dynamics with a wide range of Reynolds Number are described by the Navier-Stokes equation group, from which seems not available to fix out a general solution of these equations even for spherical particles, experimental investigations are needed to derive the relationship between the drag coefficient and the related Reynolds Number. Experimental investigations started approximately 100 years ago, in 1940, Lapple-Shepherd (Lapple, 1940) summarized the research result of historical data and presented these average data graphically, as shown in Figure 1.1, and Schlichting (Schlichting, 1960) considered this plot as the standard drag curve.

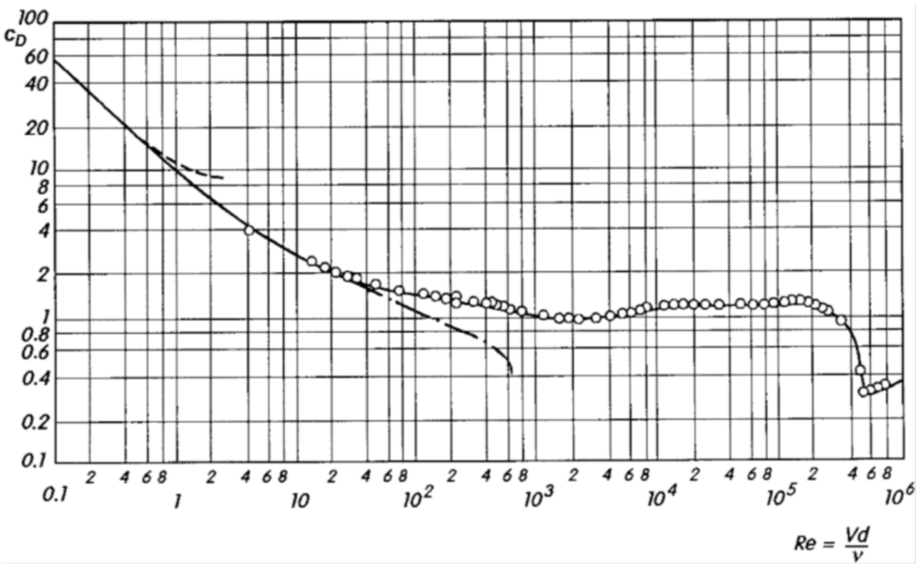


Figure 1.1 The historical Standard Drag Curve by Schlichting (Schlichting, 1960)

The drag experienced by a spherical particle is the result of a specific velocity distribution of the fluid around the solid surface of the particle. Boundary layer theory was introduced to qualify this velocity distribution by Prandtl (Prandtl, 1928). As the development of modern computer science on CFD (Computational Fluid Dynamics) codes, flow around the sphere in different flow regime divided by Reynolds number can be simulated. With the help of CFD simulation, Jones and Clarke (Jones and Clarke, 2008) discriminated the following flow regimes:

1) $Re_T \leq 20$: Perfect laminar flow, described by Stokes' law:

$$C_d = \frac{24}{Re_T} \tag{1.1}$$

2) $20 \leq Re_T \leq 210$: Steady axisymmetric flow with a growing recirculating wake.
3) $210 \leq Re_T \leq 270$: Steady planar-symmetric flow regime.
4) $270 \leq Re_T \leq 400$: Unsteady planar-symmetric flow regime.
5) $400 \leq Re_T \leq 1000$: Unsteady asymmetric flow regime.
6) $1000 \leq Re_T \leq 3.8 \times 10^5$: Turbulent regime with Newton's observations (Newton 1999):

$$C_d = 0.44 \tag{1.2}$$

After an overview of the different flow regimes during the drag on spherical particles, it has been a challenge for researchers to develop empirical correlations for the drag coefficient vs. the Reynolds number relationship for the entire flow regime. For the laminar flow regime ($Re_T < 0.5$) and turbulent flow regime ($1000 \leq Re_T \leq 380{,}000$), the drag coefficient of spherical particles is given by Stokes' Law (shown as Equation 1.1) and Newton's Law (shown as Equation 1.2) respectively. As the Rynolds number increase, corrections to Stokes' law are necessary. For a certain Reynolds number region ($20 \leq Re_T \leq 1000$), the drag coefficient C_d can only be determined experimentally. Several empirical drag coefficient models have been developed based on experimental drag values obtained by heavy particle settling experiment. Since then, a number of works have been published, such as that of Goldstein (Goldstein, 1929). After 1960, hundreds of studies have been conducted and published, and tens of correlations have been developed for drag coefficient. A number of available correlations are presented in Table 1.1 and Figure 1.2.

Table 1.1 Empirical correlations for the drag coefficient of spherical particles

Research	Year	Empirical correlation
Goldstein	1929	$C_D = \frac{24}{Re_T}(1 + polynomal\ of\ Re_T)$
Shiller-Naumann	1933	$C_D = \frac{24}{Re_T}(1 + 0.15Re_T^{0.687})$
Kaskas	1970	$C_D = \frac{24}{Re_T} + \frac{24}{Re_T^{0.5}} + 0.4$
Clift-Gauvin	1971	$C_D = \frac{24}{Re_T}(1 + 0.15Re_T^{0.681}) + \frac{0.42}{1+\frac{42500}{Re_T^{1.16}}}$
Turton-Levenspiel	1986	$C_D = \frac{24}{Re_T}(1 + 0.173Re_T^{0.657}) + \frac{0.413}{1+\frac{16300}{Re_T^{1.09}}}$
Haider-Levenspiel	1989	$C_D = \frac{24}{Re_T}(1 + 0.1806Re_T^{0.6459}) + \frac{0.4251}{1+\frac{6880.95}{Re_T}}$
Ganser	1993	$C_D = \frac{24}{Re_T}(1 + 0.1118Re_T^{0.6567}) + \frac{0.4305}{1+\frac{3305}{Re_T}}$
Brown-Lawler	2003	$C_D = \frac{24}{Re_T}(1 + 0.15Re_T^{0.681}) + \frac{0.407}{1+\frac{8710}{Re_T}}$
Cheng	2009	$C_D = \frac{24}{Re_T}(1 + 0.27Re_T)^{0.43} + 0.47[1 - \exp(-0.04Re_T^{0.38})]$

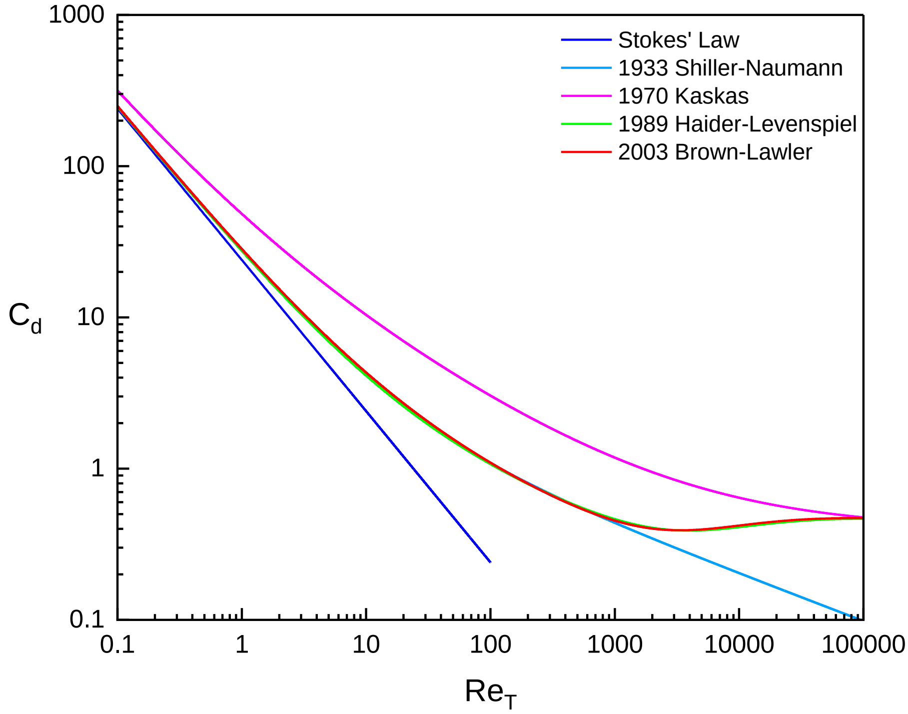


Figure 1.2 Empirical correlations for the drag coefficient of spherical particles

From the Table 1.1 and Figure 1.2, it is clear that these empirical correlations vary in their mathematical forms, often depending on the assumed flow regime.

In the low Reynolds number range, the curves of the empirical drag coefficient correlations converge, indicating agreement between the correlations in this laminar flow regime.

As the Reynolds number increases, the drag coefficient curves begin to diverge, showing differences in how each drag coefficient empirical correlation models the transition from laminar to turbulent flow. The curve of Stokes' Law quickly drops off as it's only applicable for very low Reynolds number region. Schiller-Naumann model ignore the turbulent regime, and only rectified the Stoke’s Law, thus, with the increasing Reynolds number, the deviation of this model become significant. From the correlation equation of Kaskas drag coefficient model, it is clear that during his research, two different flow regime was considered to be occurred in this flow regime in this region. However, it was simply assumed transforming directly from laminar to turbulent flow regime, and only the Stokes' part had been empirical rectified while the turbulent part directly took the result of Newton's observations. With the development of fluid dynamic understanding, based on the Shiller-Naumann model, Haider and Levenspiel (Haider and Levenspiel, 1989) developed the model combined the Stokes’ Law rectification with the transforming of the turbulent part as a function of Reynolds number, provided a more accuracy drag coefficient prediction in this region.

At higher Reynolds numbers, the curves show differences in the drag crisis region and the transition to fully turbulent flow, where the drag coefficient becomes stable.

Experimental drag value data for conventional models for predicting the drag coefficient are primarily based on experiments with heavy particles settling in fluids for lower Reynolds number region or wind trunnel experiment for higher Rynolds number region. These spherical particles were made by material like iron, zeolite or glass, the particle density of these spheres was much larger than the fluid density surrounding them, which means with the same sphere diameter, the mass of these particles were large and the inertial force of these spherical particles were also very large, wake behind the spheres causing less validation on their motion, moving almost vertical down in the fluid during the settling experiment.

In principle, the nature of the drag force for both free-rising and free-falling spheres is the same but in different directions, upwards and downwards respectively, which has been long believed that they both obey the same laws established from free-settling experiment. And few studies have addressed the drag coefficient for free-rising particles or took free-rising particles into experimental consideration. Thus, drag coefficient research of free-rising light particles has developed. In 1992, Dr. Karamanev's (D. G. Karamanev et al., 1992) research results showed that both the terminal velocity and the trajectory of free-rising particles and free-falling particles are different. The free-rising light spherical particles were made by materials with density lower than the surrounding fluid, such as PP, PMMA, or EPS foam, in another words, the inertial force of these spheres is relatively small because of their light mass weight. This cause their rising motion in fluid is more sensitive with the change of the surrounding fluid dynamic such as wake behind them. The traditional empirical correlation models are not able to accurately capture this motion behavior of light particles rising through a fluid, especially at low Reynolds numbers.

Dr. Karamanev's report suggested separated the flow regime into two parts that obey the traditional drag coefficient model and Newton Law respectively with the critical point when Re_T/d_p equals to 1450. But several research has presented dissenting views (C.H.J Veldhuis et al., 2009) for the drag coefficient prediction accuracy of their work, specifically the critical Reynolds number point. But no specific drag coefficient empirical correlation model is developed for free-rising spherical particles.

The study of particle drag coefficients is a multifaceted field that combines theoretical, experimental, and computational approaches. Thus, in this study, a more specified empirical correlation drag coefficient is developed for free-rising spherical particles, and then compared with traditional particle drag coefficient model of Haider-Levenspiel and Brown-Lawler (Haider and Levenspiel,1989; Brown and Lawler, 2003). Continued research in this area is essential for improving the accuracy of models and expanding their applicability to a wider range of particles and flow conditions.

1.3 Movement of free-rising spherical particles

The concept of free-rising particles encompasses a diverse array of scenarios wherein particulate matter ascends through a fluid medium without external propulsion. These particles, which can range from bubbles to solid objects of varying geometries, exhibit an intricate interplay between buoyancy and fluid dynamics forces as they navigate their upward trajectory.

In this study, the free-rising spherical particle is the solid particles with density lower than the liquid fluid medium it path. The behavior of free-rising particles is largely governed by their inherent properties, such as density, shape, and size, as well as the characteristics of the surrounding fluid, including viscosity and flow conditions (Durey et al., 2021).

Researchers have observed and categorized different modes of motion for free-rising particles, each characterized by distinct patterns and oscillations. The 'longitudinal' regime, wherein the particle aligns with its path of motion and experiences pronounced oscillations, contrasts with the 'broadside' regime, in which the particle orients perpendicularly to the flow and exhibits attenuated oscillations (Will et al., 2021; Will & Krug, 2021).

In this study, with the help of high-speed video camera and high-speed video imaging analysis software, a brief movement phenomena analysis of the free-rising spherical particles in liquid fluid medium. A detailed particle velocity analysis in both vertical and horizontal direction directions is conducted.

1.4 Research Objectives

The purpose of this research is to develop a comprehensive understanding of the drag coefficient behavior for free-rising spherical particles in different fluid mediums. The objectives of this study are:

1) Investigate the drag coefficient and movement phenomena of free-rising spherical particles in different fluid mediums.
2) Establish a new drag coefficient model that provides more accurate predictions for free-rising spherical particles in certain Reynolds number region, which traditional models have not adequately addressed.
3) Investigate the movement phenomena of free-falling and free-rising spherical particles with varying density different ratio between the particles and the fluid in order to understand the interactions between these particles and fluid dynamics.

These objectives aim to bridge the gap in understanding the dynamics of free-rising particles, thereby enhancing the efficiency and effectiveness of fluidization technologies in various industrial processes.

1.5 Theis Structure

Chapter 1 presents an introduction and background information on fluidization technology and the development of drag coefficient for particles, with a specific focus on free-rising spherical particles. It outlines the research objectives and the structure of this thesis.

Chapter 2 introduces the preparation for the spherical particles falling or rising test experiment. It describes the use of video image acquisition systems to analyze the particle terminal velocity and movement behavior of different spherical particles (density and mean diameter).

Chapter 3 reports the analysis results of the drag coefficient for different spherical particles in two motion modes: free-falling mode and free-rising mode. The experiments were conducted in two different liquid systems: fresh water and salted water. This chapter also presents a drag coefficient fitting equation for free-rising spherical particles based on the classical drag coefficient equation.

Chapter 4 discusses the movement behavior analysis results of free-rising spherical particles in different density differences between the particle and the liquid system. The analysis is divided into three density difference modes: low-density-difference, high-density-difference, and mid-density-difference modes.

Chapter 5 provides the conclusions drawn from this thesis and offers recommendations for future research on the drag coefficient and movement of free-rising spherical particles.

Chapter 2 Experimental setup and Measurement techniques

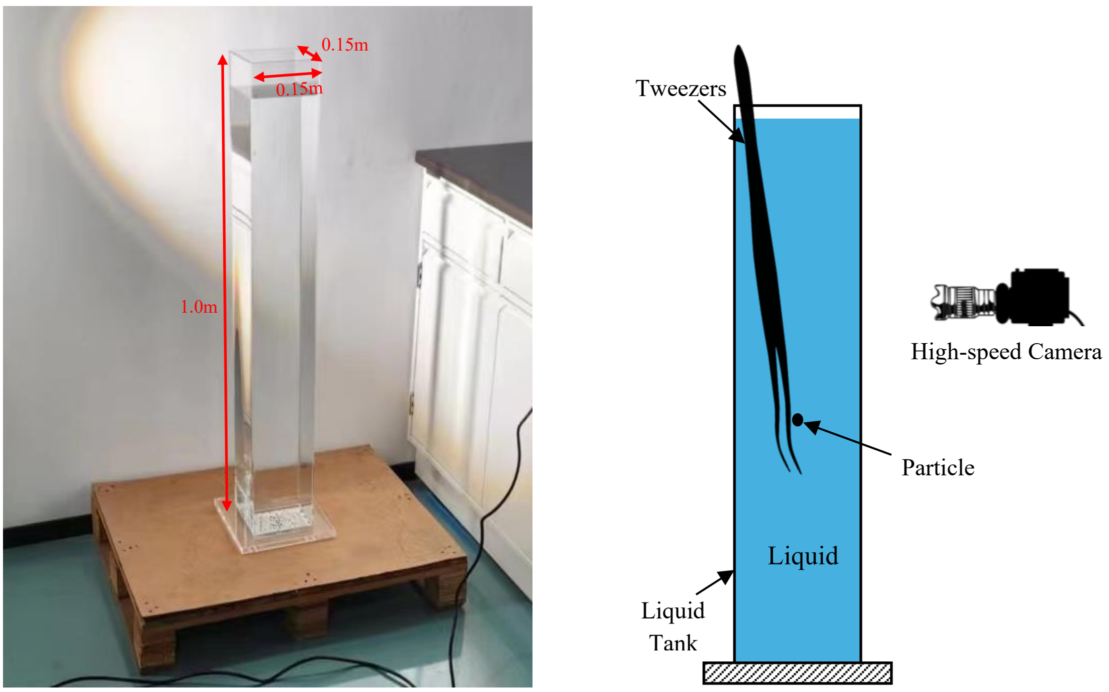
2.1 Introduction

The experiments were conducted with spherical particles in the size range from $1.90{\sim}6.25\ \mathrm{mm}$ and particle densities ranging from $18{\sim}1500\ \mathrm{kg/m^3}$. The particles were released to fall or rise from rest in two types of fluids. This chapter describes the materials, fluids, property characterizations, and experimental methods.

2.2 Experimental setup

The experiments were performed in an acrylic (Polymethyl Methacrylate) tank with a rectangular inner cross-section of dimensions $0.15 \times 0.15 \times 1\ \mathrm{m^3}$, in which the geometric cross-diameter of the tank $D = 150\ \mathrm{mm}$. The experimental apparats are presented in Figure 2.1 (a) and Figure 2.1 (b), respectively. The size of the experimental tank was chosen based on the following considerations:

- It is possible to track the spherical particle for a sufficiently long distance.
- There is negligible effect of side walls when the particle mean dimeter to tank geometric cross-diameter ratio d_p/D is lower than 0.05 (Arsenijević et al., 2010).



(a) **(b)**

Figure 2.1 (a) Settling Tank, and (b) Experimental Apparatus

Owing to the small volume (22.5 liters) of the tank, fresh water (filtered tap water) and salted water (Sodium Chloride blended with filtered tap water) were used for the experiments. The properties of fresh water and salted water (density and viscosity, as listed in Table 2.1) were measured in the laboratory. Each density of was measured at least three times and averaged, and the viscosity of the liquid was obtained from handbooks with Viscosity-Temperature Map.

Table 2.1 Properties of Fresh Water and Salted Water

Liquid	Density, ρ_f $\mathrm{kg/m^3}$	Viscosity, μ $\mathrm{Pa \cdot s}$
Fresh Water	999.9	0.0014
Salted Water	1157.4	0.0015

The spherical particle free-falling or free-rising experiments were conducted within no more than 3~4 days after the tank was filled with different liquid system, as the level of contamination increase over time for still liquid. Otherwise, the tank was drained and refilled for the next spherical particle experiment.

The viscosity of the two different liquid systems was controlled by maintaining the ambient temperature in the room with air conditioner. In this study, the temperature of fresh water and salted water was varied from 7~10 ℃, with the uncertainty in the temperature-dependent liquid density and kinematic viscosity considered negligible for the spherical particle experiments.

To eliminate any micro air bubbles on the surface of particles, tested spheres (except the wood particles due to their absorbing properties) were immersed in the liquid for 24 hours. The wood particles were immersed in the liquid for 1 hours with sonic vibration assistance.

Velocity as a function of time and position was measured by a high-speed video camera (QianYanLang M230) with frame rates of up to 3000 frames per second. In the present experiment, the high-speed video camera was set at 2500 frames per second with an exposure time of 25 μs, ensuring that the high-speed video camera captured rapid movements without losing key details for analysis in the video image acquisition system.

The heavy particles were released at the position beneath the liquid surface that has fully submerged the particles by sharp-head tweezers, and the light particles were slowly and gently delivered at least 50 cm below the water surface by using a pair of long-arm sharp-head tweezers, ensuring minimal contact with the spheres. The particles were held in position for 5 minutes period before release, allowing the liquid to settle. The tweezers were not removed until the particles touch the bottom of the tank or float on the liquid surface, and between each test was a 5 minutes period for liquid quiescent.

2.3 Particle properties

The mean diameter d_p of nearly spherical particles ($\psi_p = 0.9 \sim 1$) was measured using a microscope and software Image-Pro Plus 6.0 with ± 1 μm accuracy. Measurements were taken from three different filming angles and averaged with standard deviation $\sigma \leq 5$ %. The particle density was simply measured by density scales measurements. In this experiment, a counted number of EPS particles were weighted, and then measured the volume. Each density was measured at least three times and averaged. With the liquid properties mentioned in the Table 2.1, the Archimedes Number (Ar), presented by Equation 2.1, can be calculated.

$$Ar = \frac{\rho_f |\rho_p - \rho_f| g d_p^3}{\mu^2} \tag{2.1}$$

Free-falling spherical particles of two different materials and different size were tested in this study, as shown in Table 2.2.

Table 2.2 Free-falling particle properties for experiment in fresh water

Code	Material	d_p, mm	d_p/D	ρ_p, kg/m^3	Ar
PP-2.494-FW	PP	2.494	0.017	1389.3	32448
PP-3.478-FW	PP	3.478	0.023	1424.8	95968
PMMA-3.553-FW	PMMA	3.553	0.024	1085.9	20706
PMMA-2.757-FW	PMMA	2.757	0.018	1099.7	11241
PMMA-1.984-FW	PMMA	1.984	0.013	1100.4	4216

In the particle free-rising experiment in fresh water, free-rising spherical particles with three different materials and different size were tested in this study, as shown in Table 2.3. For the free-rising particle test in fresh water, the same light particles were retested at least three times for analysis.

Table 2.3 Free-rising particle properties for experiment in fresh water

Code	Material	d_p, mm	d_p/D	ρ_p, kg/m^3	Ar
PP-3.211-FW	PP	3.211	0.021	692.5	54645
PP-3.050-FW	PP	3.050	0.020	875.4	18972
PP-2.435-FW	PP	2.435	0.016	794.1	15950
PP-2.031-FW	PP	2.031	0.014	456.2	24446
WD-5.915-FW	Wood	5.915	0.039	673.9	362288
WD-2.561-FW	Wood	2.561	0.017	455.1	49123
EPS-6.197-FW	EPS	6.197	0.041	18.0	1255019
EPS-5.430-FW	EPS	5.430	0.036	18.0	844355
EPS-4.752-FW	EPS	4.752	0.032	18.0	566010
EPS-3.636-FW	EPS	3.636	0.024	18.0	253506
EPS-3.091-FW	EPS	3.091	0.021	18.0	155705
EPS-2.625-FW	EPS	2.625	0.017	18.0	95370
EPS-2.369-FW	EPS	2.369	0.016	18.0	70096

To change the density of an EPS sphere with a given diameter, stainless steel ball with diameter much smaller than the particle diameter was inserted into the particles. Special inserting process and check was conducted to avoid changing the mass center from the original geometrical center of the sphere. as shown in Table 2.4. For the special free-rising particle test in fresh water, the same light particles were retested at least three times for analysis.

Table 2.4 Special free-rising particle properties for experiment in fresh water

Code	Material	d_p, mm	d_p/D	ρ_p, kg/m^3	Ar
EPS-S-5.503-FW	EPS-Iron	5.503	0.037	343.7	587431
EPS-S-4.192-FW	EPS-Iron	4.192	0.028	414.8	231504

Regarding the particles adopted in the particle free-rising experiment in salted water, free-rising spherical particles of three different materials and different size were tested in this study, as shown in Table 2.5. For the free-rising particle test in slated water, the same light particles were retested at least three times for analysis.

Table 2.5 Free-rising particle properties for experiment in salted water

Code	Material	d_p, mm	d_p/D	ρ_p, kg/m^3	Ar
WD-6.258-SW	Wood	6.258	0.042	615.7	670290
WD-2.861-SW	Wood	2.861	0.019	570.8	69364
PP-3.228-SW	PP	3.228	0.022	738.4	71146
PP-3.059-SW	PP	3.059	0.020	1000.8	22640
PP-2.474-SW	PP	2.474	0.016	882.6	21014
PP-2.030-SW	PP	2.030	0.014	456.9	29567
EPS-6.077-SW	EPS	6.077	0.041	18.0	1291333
EPS-5.240-SW	EPS	5.240	0.035	18.0	827950
EPS-5.078-SW	EPS	5.078	0.034	18.0	753425
EPS-3.353-SW	EPS	3.353	0.022	18.0	216788
EPS-2.395-SW	EPS	2.395	0.016	18.0	79012
PMMA-3.514-SW	Acrylic	3.514	0.023	1100.4	12497
PMMA-2.812-SW	Acrylic	2.812	0.019	1031.2	14158

2.4 Terminal velocity u_T measurements

The terminal velocity u_T of particles is the constant velocity that a free-falling or free-rising object eventually reaches when the resistance of the medium through which it is falling or rising prevents further acceleration. At terminal velocity, the force of gravity is balanced by the drag force and buoyancy force for free-falling mode, the force of buoyancy is balanced by the drag force and gravity force for free-rising mode, resulting in zero net force and no further acceleration.

In this experiment, high-speed video image acquisition open-source software Tracker (Version 6.1.6) was used to analysis the particle instantaneous velocity. The principle of the system is firstly setting a 2D coordinate system and calibration tool for the video before tracking process. Video's frame rate and the data collection step size is also settled manually in this step. Point Mass Track method automatic tracking process is then activated after choosing the mass center manually from the start frame. Collected coordinate of particle (x-axial and y-axial) then can be used to calculate the particle instantaneous velocity in the vertical and horizontal direction respectively with the calculation Equation 2.2.

$$v_{xi} = \frac{x_{i+1} - x_{i-1}}{2 \cdot dt} \quad \text{or} \quad v_{yi} = \frac{y_{i+1} - y_{i-1}}{2 \cdot dt} \tag{2.2}$$

Typical measurements of particle terminal velocity (vertical particle velocity) for two motion mode are presented in Figure 2.2(a) and Figure 2.2(b), respectively.

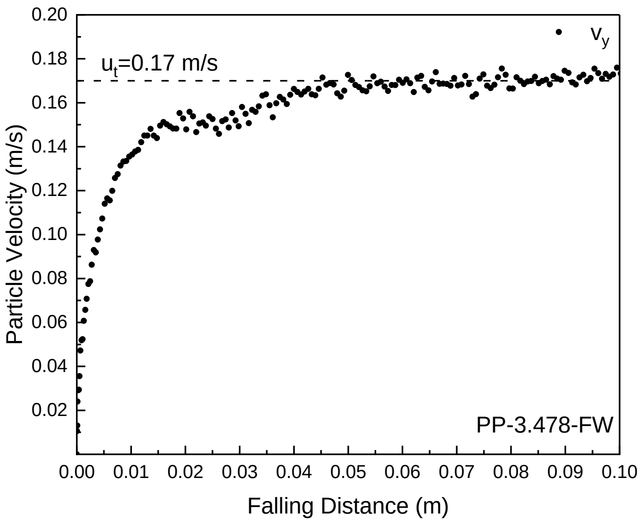


Figure 2.2 (a) Sample measurements for the sphere falling velocity in fresh water

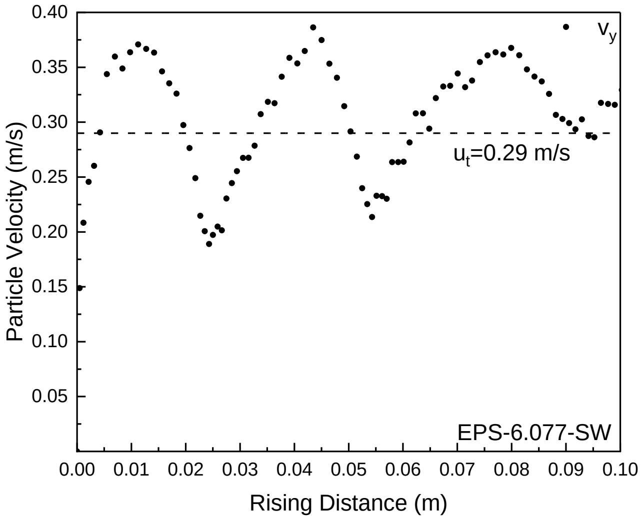


Figure 2.2 (b) Sample measurements for the sphere rising velocity in salted water

It was found that for free-falling spherical particles, the velocity increased as a function of the particle position until it reached at stable zone where the particle moves in constant terminal velocity. However, for the free-rising particles, the stable zone is quite different from the one of free-falling particles, the velocity in this zone is continuously periodically increased and decreased owing to vortex shedding and other influences. Thus, in this study, terminal velocity for the free-rising particles is defined as the average value of velocity in stable zone.

The accelerating distance for particles reaching terminal velocity is much shorter than the range taken by the high-speed video camera in both free-falling sphere experiments and free-rising sphere experiments, ensuring the collected particle position data are accurate enough for further particle movement analysis.

Chapter 3 Drag coefficient of spherical particles

3.1 Introduction

When a single particle or a group of particle achieves force equilibrium in a static fluid, mainly the balance of gravity force, buoyancy force and drag force, the particle moves in terminal velocity through the fluid. For particle moving through fluid, when terminal velocity is attained, the following force balance Equation 3.1 for free-falling spherical particles and Equation 3.2 for free-rising spherical particles can be established.

$$F_{Gravity} = F_{Buoyancy} + F_{Drag} \tag{3.1}$$

$$F_{Buoyancy} = F_{Gravity} + F_{Drag} \tag{3.2}$$

Based on Equation 3.1 and Equation 3.2 with force formula for each part, the following detailed force balance Equation 3.3 and Equation 3.4 can be set up.

$$\frac{4\pi}{3}\left(\frac{d_p}{2}\right)^3 \cdot \rho_p \cdot g = \frac{4\pi}{3}\left(\frac{d_p}{2}\right)^3 \cdot \rho_f \cdot g + \frac{1}{2} \cdot \rho_f \cdot \pi \left(\frac{d_p}{2}\right)^2 \cdot C_d \cdot u_T^2 \tag{3.3}$$

$$\frac{4\pi}{3}\left(\frac{d_p}{2}\right)^3 \cdot \rho_f \cdot g = \frac{4\pi}{3}\left(\frac{d_p}{2}\right)^3 \cdot \rho_p \cdot g + \frac{1}{2} \cdot \rho_f \cdot \pi \left(\frac{d_p}{2}\right)^2 \cdot C_d \cdot u_T^2 \tag{3.4}$$

Then the Equation 3.3 and Equation 3.4 can be simplified into Equation 3.5.

$$u_t = \sqrt{\frac{4}{3} \cdot \frac{g \cdot d_p \cdot |\rho_p - \rho_f|}{\rho_f \cdot C_d}} \tag{3.5}$$

$$Re_T = \frac{d_p \cdot u_t \cdot \rho_f}{\mu} \tag{3.6}$$

Hence, the analysis of the particle motion involves understanding the key parameters, which are the particle terminal velocity and other two related dimensionless number, drag coefficient C_d for drag force analysis and terminal Reynolds number Re_T according to Equation 3.6 for flow patterns prediction. It should be emphasized that the drag coefficient cannot be directly measured through experiments. Thus, establishment of a relevant equation between drag coefficient C_d and terminal Reynolds number Re_T is vital for predicting the particle terminal velocity with particle and fluid properties. The terminal velocity of the particles directly from the experimental, drag coefficient calculated by Equation 3.5, terminal Reynolds number calculated by Equation 3.6, and density ratio $\bar{\rho}$ ($\bar{\rho} = \rho_p/\rho_f$, the closer to 1, the lower density difference between particle and liquid) were shown in Table 3.1 (a), (b) and (c).

Table 3.1 (a) u_T, Re_T, C_d and $\bar{\rho}$ of free-falling experiment in fresh water

Code	u_T, m/s	Re_T	C_d	$\bar{\rho}$
PP-2.494-FW	0.134	247.7	0.71	1.39
PP-3.478-FW	0.177	455.6	0.62	1.43
PMMA-3.553-FW	0.048	127.4	1.70	1.09
PMMA-2.757-FW	0.037	75.0	2.67	1.10
PMMA-1.984-FW	0.068	100.5	0.56	1.10

Table 3.1 (b) u_T, Re_T, C_d and $\bar{\rho}$ of free-rising experiment in fresh water

Code	u_T, m/s	Re_T	C_d	$\bar{\rho}$
PP-3.211-FW	0.072	170.0	2.52	0.69
PP-3.050-FW	0.067	152.2	1.09	0.88
PP-2.435-FW	0.055	99.2	2.16	0.79
PP-2.031-FW	0.050	74.7	5.83	0.46
WD-5.915-FW	0.139	609.4	1.30	0.67
WD-2.561-FW	0.103	196.1	1.70	0.46
EPS-6.197-FW	0.287	1315.5	0.97	0.02
EPS-5.430-FW	0.263	1055.8	1.01	0.02
EPS-4.752-FW	0.256	900.7	0.93	0.02
EPS-3.636-FW	0.230	620.0	0.88	0.02
EPS-3.091-FW	0.178	345.7	1.06	0.02
EPS-2.625-FW	0.168	295.1	1.07	0.02
EPS-2.369-FW	0.185	422.6	1.16	0.02
EPS-S-5.503-FW	0.216	882.1	1.00	0.34
EPS-S-4.192-FW	0.191	594.0	0.88	0.42

Table 3.1 (c) u_T, Re_T, C_d and $\bar{\rho}$ of free-rising experiment in salted water

Code	u_T, m/s	Re_T	C_d	$\bar{\rho}$
WD-6.258-SW	0.189	915.3	1.07	0.53
WD-2.861-SW	0.114	252.2	1.45	0.49
PP-3.228-SW	0.111	277.8	1.23	0.64
PP-3.059-SW	0.112	263.8	0.43	0.87
PP-2.474-SW	0.094	178.7	0.88	0.76
PP-2.030-SW	0.072	112.6	3.11	0.40
EPS-6.077-SW	0.293	1375.4	0.91	0.02
EPS-5.240-SW	0.284	1148.7	0.84	0.02
EPS-5.078-SW	0.270	1058.2	0.90	0.02
EPS-3.353-SW	0.188	485.7	1.23	0.02
EPS-2.395-SW	0.164	304.2	1.14	0.02
PMMA-3.514-SW	0.071	193.9	0.44	0.95
PMMA-2.812-SW	0.044	95.4	2.08	0.89

3.2 Experimental Details

To establish a comprehensive and relevant equation between the drag coefficient C_d and the terminal Reynolds number Re_T for free-rising spherical particles, it is crucial to validate the experimental methodology using free-falling spherical particles in fresh water. This validation ensures that the experimental setup, measurement techniques, and data analysis methods are reliable and can be applied consistently to both free-falling and free-rising scenarios.

In stage 1, free-falling spherical particle experiment in fresh water was conducted and the particle terminal velocity u_T was calculated by Equation 2.2 and then the terminal Reynolds number Re_T was calculated by Equation 3.6. The result was then being compared with stander Drag Coefficient versus Reynolds Number curve.

In stage 2, free-rising spherical particle experiment in fresh water was conducted with particles of different material and different size.

In stage 3, to increase the density difference between particles and liquid, salted water was conducted as fluid medium for free-rising particle experiment with particles of different material and different size.

These three stages ensure a comprehensive analysis of the particle motion in different fluid mediums and conditions. By validating the experimental method with free-falling particles and then applying it to free-rising particles in both fresh and salted water, we can thoroughly investigate the relationship between the drag coefficient and terminal Reynolds number for various particles and fluid densities.

3.2.1 Free-falling spherical particles in fresh water

To ensure the experimental setup, measurement techniques, and data analysis methods are reliable and can be applied consistently to both free-falling and free-rising scenarios, heavy free-falling spherical particle with two types of materials and different diameter were conducted in this experiment stage. The image data was then analysed by Tracker and compared to the standard Drag Coefficient models (Haider and Levenspiel,1989; Brown and Lawler, 2003) as shown in Figure 3.1.

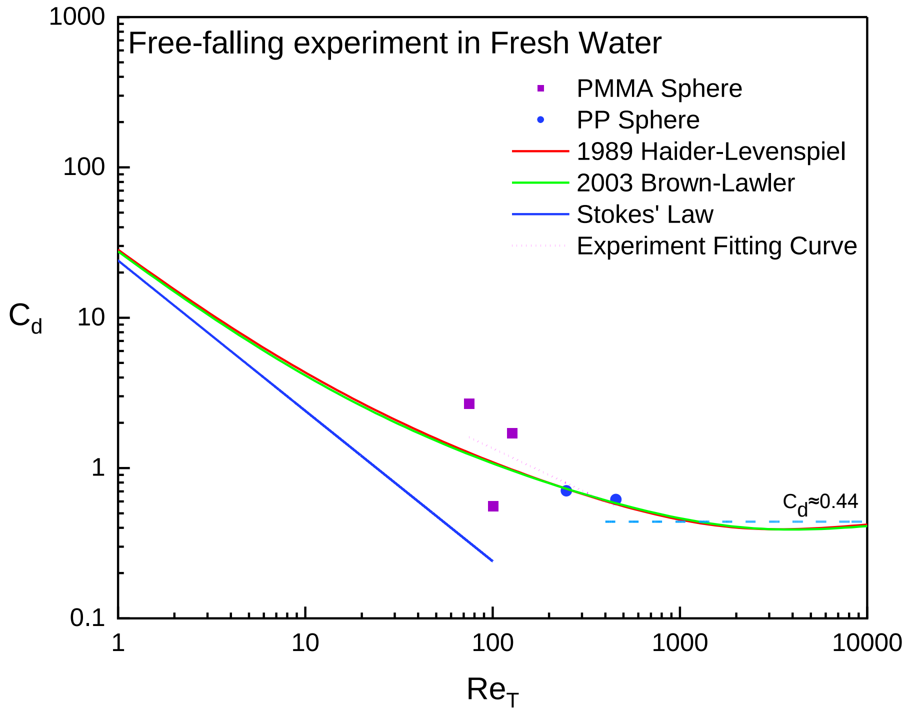


Figure 3.1 C_d vs. Re_T of Free-falling spherical particles in fresh water

From the Figure 3.1, it is clear that C_d for PP spheres generally follows the trend predicted by both Haider-Levenspiel and Brown-Lawler models, while the scatter at Reynolds number value $20 \leq Re_T \leq 210$, PMMA spheres have a significant deviation with the conventional models. Especially for the PMMA-1.984-FW with the smallest particle diameter but seems have the tend to enter the next flow regime much early than the traditional models expected while the other two PMMA spherical particles still stay in the last flow regime with lag effect.

Flow regime in Reynolds number region $20 \leq Re_T \leq 210$ exhibits steady axisymmetric flow with a growing recirculating wake behind the spheres and then enter the steady planar-symmetric flow regime with the Reynolds number value increased to larger than 210. Thus, in this Reynolds number region exhibits flow regime transforming with the increasing recirculating wake behind the spheres. And this instability of wake growing as well as the flow regime transforming may cause the deviation between the drag coefficient prediction and the experimental data.

From Table 3.1 (a), the PMMA spherical particles have the properties with low density difference with the surrounded fluid density, the density difference ratio is near to 1. From Equation 3.1, the gap value between the gravity forces and buoyancy force is equal to the drag force, thus, such small gap between the two forces leads to a small drag force while cause the particle motion more sensitive to the wake dynamic behind, such as vortex shedding, which may increase the net drag forces of the spherical particle as it need to overcome the vortex influence in order to maintain its motion.

Thus, consider the complexity in this flow regime, the near to 1 density difference ratio cause the decrease of the drag force, while the vortex overcoming increase the net drag force, as well as the growing of the wake in this flow regime region, these three considerations finally cause the unstable drag force and further, the drag coefficient deviation, in this Reynolds number region for particles with such properties.

Despite the deviation of the drag coefficient for free-falling experiment, the drag coefficient tendency of these free-falling particles follows the trend predicted by both Haider-Levenspiel and Brown-Lawler models. And it provides a foundation for extending the methodology to free-rising particles and different fluid mediums.

3.2.2 Free-rising spherical particles in fresh water

In this stage, free-rising spherical particles with four different types of material and different particle size were tested in fresh water. The particle terminal velocity, drag coefficient and terminal Reynolds number were approached with the same data analysis process for free-falling spherical particle experiment in fresh water. Meanwhile, the drag coefficient and terminal Reynolds number data of free-rising spherical particles were compared to the two standard Drag Coefficient models (Haider and Levenspiel,1989; Brown and Lawler, 2003) as presented in Figure 3.2.

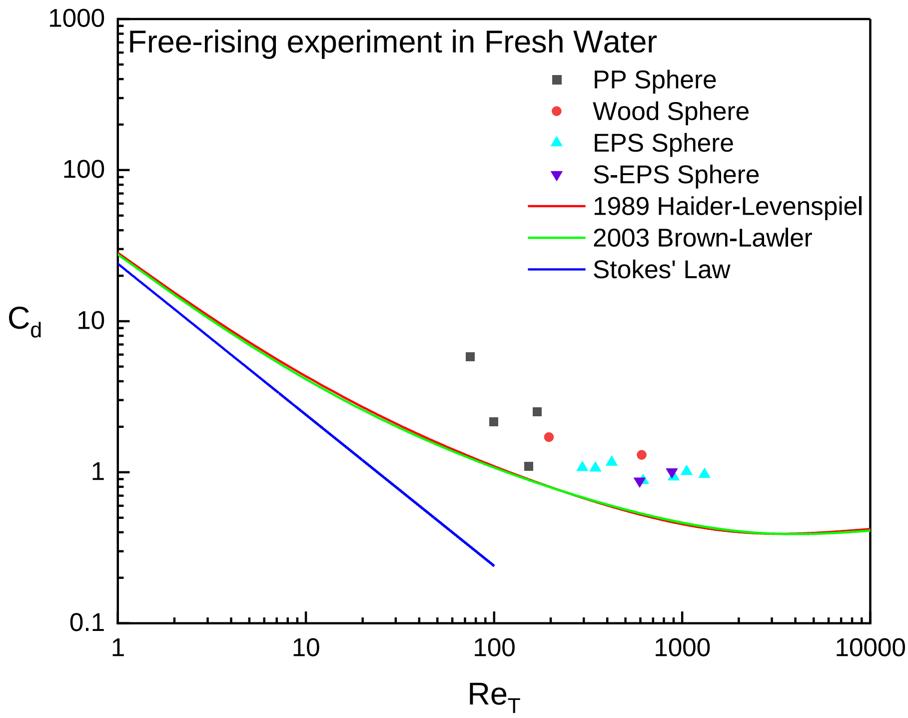


Figure 3.2 C_d vs. Re_T of Free-rising spherical particles in fresh water

Form the Figure 3.2, the C_d tendence versus terminal Reynolds number for free-rising spherical particles in fresh water were successfully compared to standard C_d versus Reynolds number curves from the Haider-Levenspiel (1989) and Brown-Lawler (2003) models. The consistency trend of the experimental data with these models validates that the existed drag coefficient models can be used to predict C_d for free-rising spherical particles. The observed scatter in Figure 3.3 shows, in higher Reynolds number zone, the experimental data and model predictions are relatively closer, though still showing a tendency for the models to underpredict C_d. In lower Reynolds number region ($0 < Re \leq 200$), the discrepancy between model predictions and experimental data becomes more pronounced. Thus, while the existing models provide a good baseline, they may not fully capture the complexities of free-rising spherical particles. Factors contributing to the scatter, such as flow regime transitions, density differences, and vortex shedding, indicate that the empirical models require adjustments to improve their predictive capability at lower Reynolds numbers.

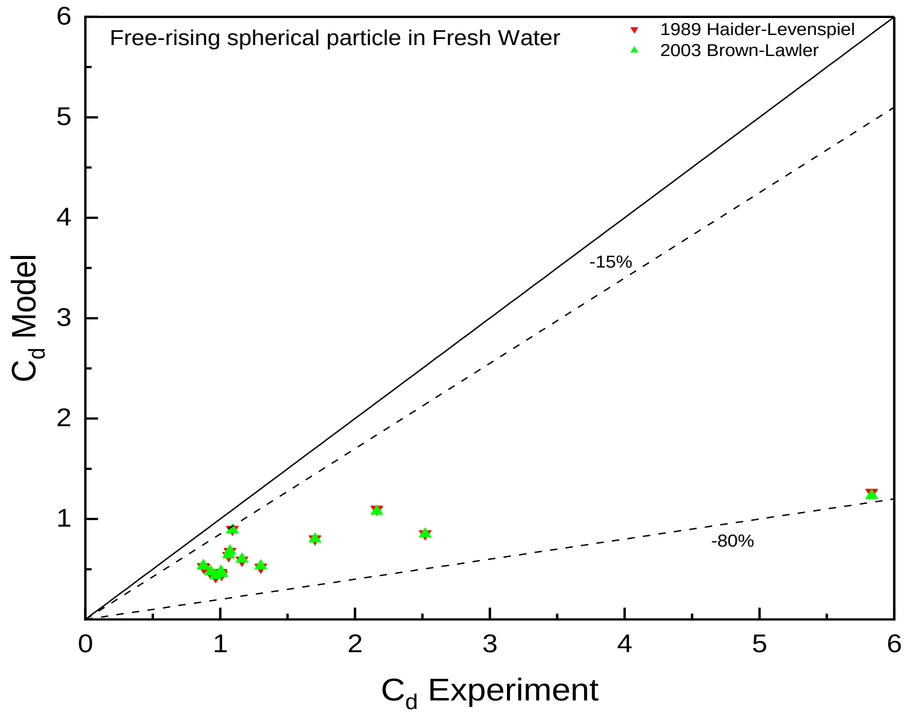


Figure 3.3 Model vs. Experiment particle drag coefficient in fresh water

The comparison of experimental data with the standard drag coefficient models in Figures 3.2 and 3.3 highlights both the strengths and limitations of existing models. Drag coefficient prediction model for free-falling particles may not be suitable for the free-rising spherical particles. While the Haider-Levenspiel and Brown-Lawler models provide a good starting point, the observed scatter suggests the need for a more refined drag coefficient model to accurately predict the behavior of free-rising spherical particles in diverse conditions.

3.2.3 Free-rising spherical particles in salted water

To increase the density difference between spherical particles and liquid system, salted water was conducted as fluid medium in this stage. Free-rising spherical particles with four different types of material and different particle size were tested in the salted water. The same as the free-rising sphere experiment in fresh water, the particle terminal velocity, drag coefficient and terminal Reynolds number were approached and the drag coefficient vs. terminal Reynolds number for free-rising spherical particles in salted water were compared to the two standard Drag Coefficient models (Haider and Levenspiel,1989; Brown and Lawler, 2003) as presented in Figure 3.4.

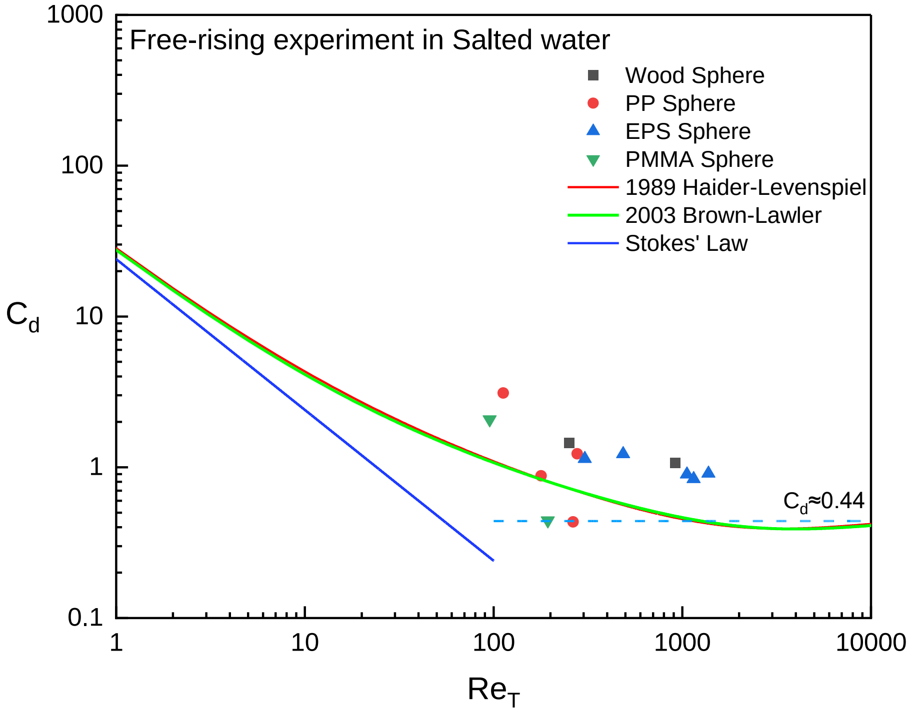


Figure 3.4 C_d vs. Re_T of Free-rising spherical particles in salted water

Form the Figure 3.4, the C_d for free-rising spherical particles in salted water has a similar tendence compared to the Haider-Levenspiel (1989) and Brown-Lawler (2003) drag coefficient prediction models. The consistency trend of the experimental data with these models further validates that the existed drag coefficient models can be used to predict C_d for free-rising spherical particles in different liquid system. However, at lower Reynolds number value ($0 < Re \leq 200$), there is more discrepancy between the experimental data and the empirical correlations. Especially for part of the PMMA particle and PP particles, its experimental C_d value is lower than the one predicted by the models. And this phenomenon is more similar to the situation in the free-falling spherical particle in fresh water (see Figure 3.1), part of the PP spheres and PMMA spheres have a rapidly decrease of drag coefficient and seems have the tend to enter the fully turbulent flow regime much early than expected. The observed scatter, shown in Figure 3.5, shows the experimental data aligns well with the empirical correlations at higher Reynolds numbers, while at lower Reynolds numbers, there are noticeable deviations.

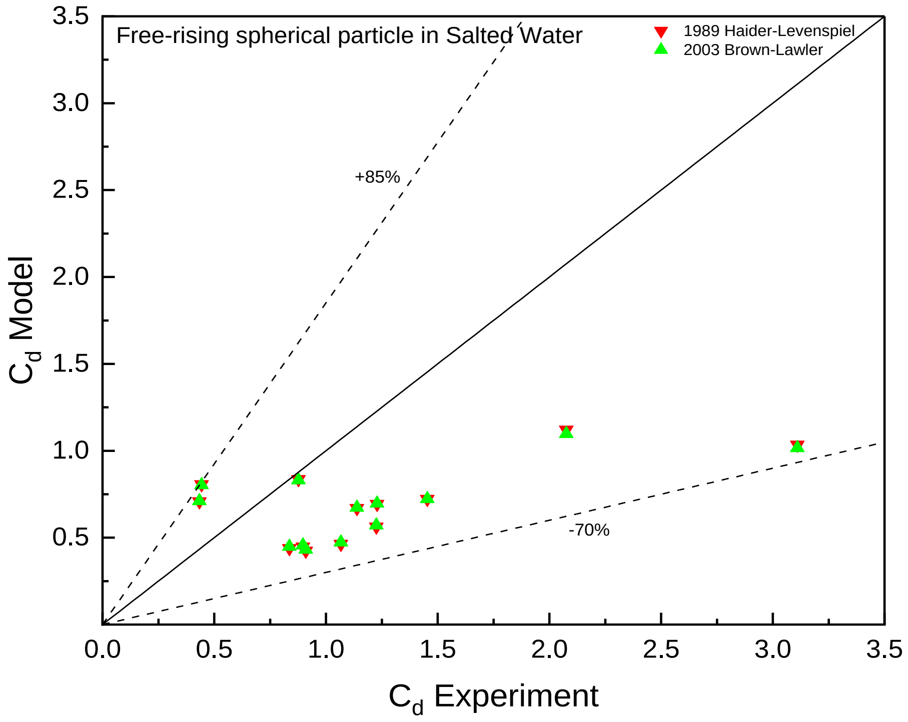


Figure 3.5 Model vs. Experiment particle drag coefficient in salted water

The comparison of experimental data with the standard drag coefficient models in Figures 3.4 and 3.5 highlights both the strengths and limitations of existing models.

For free-rising spherical particles, as the density difference between particles and the fluid medium decreases, the accuracy of traditional drag coefficient prediction models decreases rapidly. This is particularly evident in the lower Reynolds number region, where the deviation of experiments in salted water is larger than that of experiments in fresh water.

Density differences ration of particles and liquid as well as the decrease of the mechanical inertial force have a strong influence on free-rising spherical particles motion behavior. The near to 1 density difference ratio cause the decrease of the drag force, on the other hand, the vortex overcoming increase the net drag force, as well as the decrease of the mechanical inertial force causes more variation of particle motion, more forces is needed to maintain the particle stable motion, which further affects the particle drag coefficient.

The Haider-Levenspiel and Brown-Lawler models provide a solid foundation, but the observed scatter suggests the need for a more refined drag coefficient model to accurately predict the behavior of free-rising spherical particles considering the density difference.

3.3 Results and discussion

The results of free-falling spherical particles in fresh water validate that the experimental setup and methodology can be conducted to free-rising spherical particles experiments owing to the consistency of the experimental data with the empirical models in free-falling experiments.

3.3.1 Drag coefficient model for free-rising spherical particles

The experimental data for free-rising spherical particles in fresh water shows a general alignment with the Haider-Levenspiel (1989) and Brown-Lawler (2003) drag coefficient models, particularly at higher Reynolds numbers. However, these models consistently underpredicts C_d values of free-rising sphere, especially at lower Reynolds numbers ($0 < Re \leq 200$), as shown in Figure 3.6.

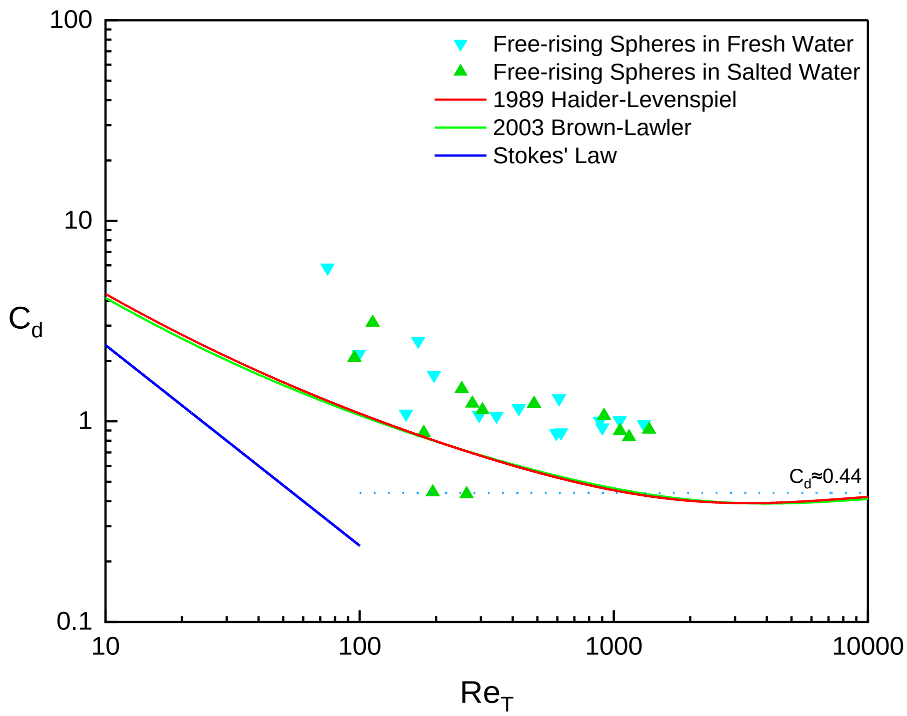


Figure 3.6 C_d vs. Re_T of Free-rising spherical particles

Thus, based on the observations and comparisons, a new drag coefficient model that functions with Reynolds number is developed. This model builds on the standard drag coefficient models and experimental result observed in the spherical particles free-rising test. A common simplified nonlinear Equation 3.7 with five parameters associated with terminal Reynolds number is given, reflecting advancements in the understanding of drag behavior based on the Stocks law over the last decades.

$$C_d = \frac{24}{Re_T}(1 + A \cdot Re_T^B) + \frac{C}{1+\frac{D}{Re_T^E}} \tag{3.7}$$

$$C_d = \frac{24}{Re_T}(1 + 536.6953 \cdot Re_T^{-0.9090}) + \frac{0.7873}{1+\frac{8.7269}{Re_T^{5.7613}}} \tag{3.8}$$

Based on equation 3.7, the experimental data were fitted and combined using MATLAB to obtain the corresponding fitted equation 3.8 as well as the values of the five corresponding parameters. The fitting result of Equation 3.8 is presented in Figure 3.7.

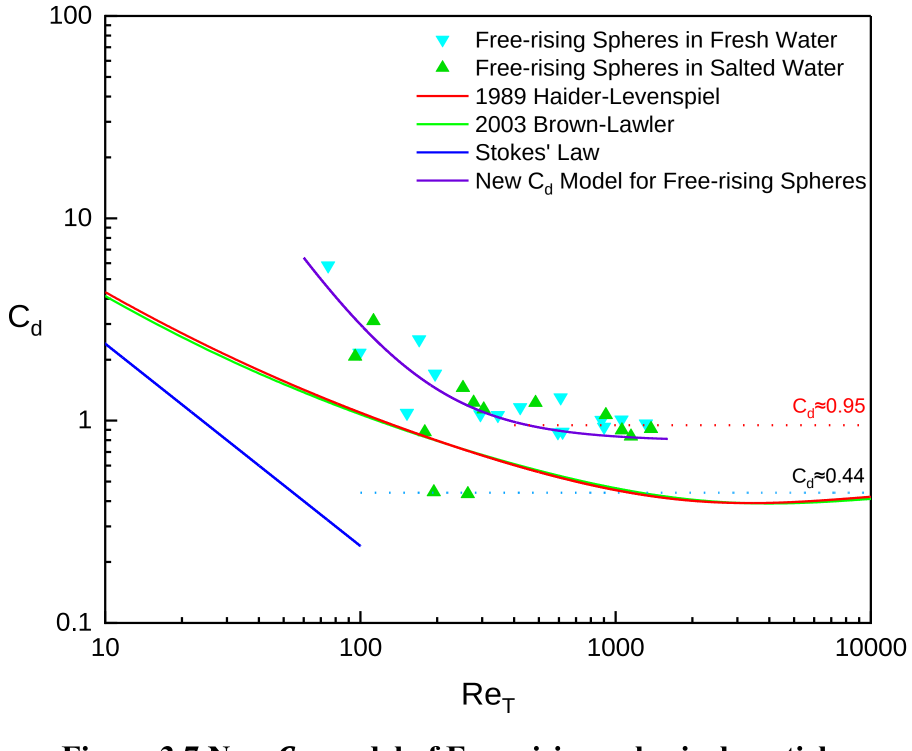


Figure 3.7 New C_d model of Free-rising spherical particles

The Figure 3.7 shows that the new developed model appears to provide a better C_d prediction for free-rising particle across the range of Reynolds numbers, particularly at lower Reynolds number values where the discrepancies are most pronounced. The accuracy of the new model is quantitatively assessed using the root mean square error (RMSE) metric. The RMSE of the drag coefficient predicted by the new model for free-rising spherical particles is 53%, which is substantially lower than the 114% RMSE observed with two conventional models. This indicates that the new model has a significantly lower error and is therefore more accurate in predicting the drag coefficient for free-rising particles. The new drag coefficient model demonstrates higher overall accuracy compared to the traditional drag coefficient represented by Haider-Levenspiel model, particularly for free-rising particles, as shown in Figure 3.8. The predicted C_d by both new C_d-Re_T model and Haider-Levenspiel model becomes small and stable at higher Reynolds number ($Re > 400$. This behavior is consistent with known fluid dynamics phenomena, where at high Reynolds numbers, inertial forces dominate, leading to reduced drag on the particle. In this regime, both models converge, but the new model still offers a more accurate prediction across the entire range of Reynolds numbers.

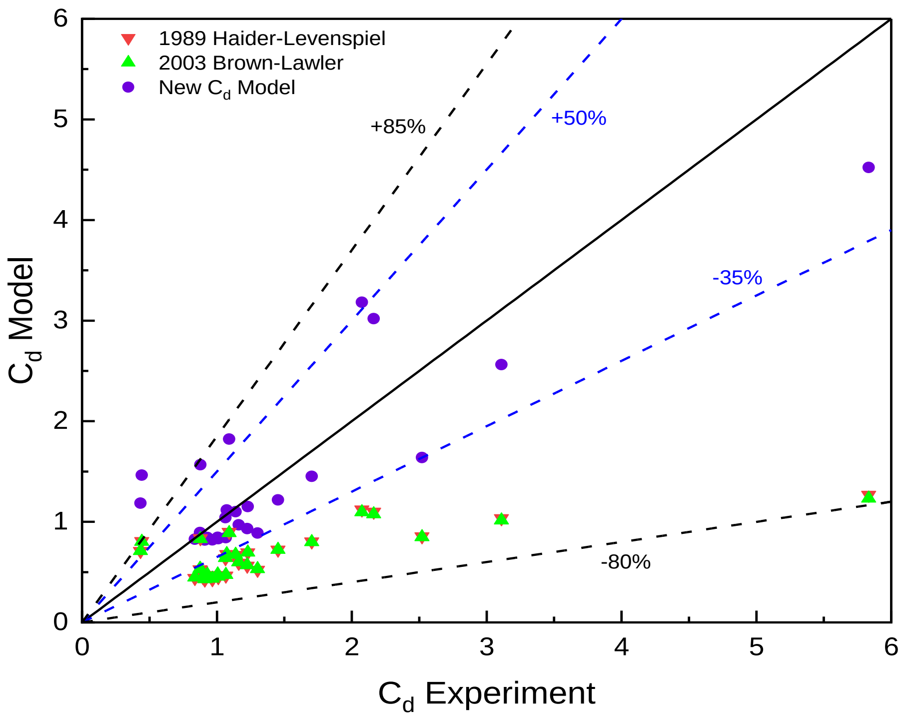


Figure 3.8 New developed model vs. Experiment particle drag coefficient

However, it shows poor prediction accuracy for free-rising particles with low density differences ($\bar{\rho} \approx 0.8 \sim 1$) in experiments, such as particle PMMA-3.514-SW and particle PP-3.059-SW. Particles with low density differences experience different forces balance compared to those with higher density differences. The buoyancy force of the free-rising sphere with high density ratio is closer to the particle's gravity force, causing the drag force to be smaller and more sensitive to variations in fluid dynamics. This sensitivity can lead to complex interactions between the particle and the surrounding fluid, such as changes in wake dynamics and flow patterns, which are not adequately considered in this study.

At the higher Reynolds number region ($\mathrm{Re} \geq 400$), the constant $\mathrm{C_d}$ value of free-rising sphere equals to 0.95, which is consistent with the value presented by Karamanev's report (Karamanev et al., 1996). However, the constant $\mathrm{C_d}$ occurring region reported by Karamanev et al. is firstly at the value $Re_T \approx 135$, which indicated that the inertial effects dominate earlier in the experiments. It is much earlier than the region mentioned by this study, which is at $Re_T \approx 400$, a later stabilization point, indicating a delayed dominance of inertial effects. At the Reynolds number region range from 135 to 400, the experimental data (see Figure 3.7) shows that the $\mathrm{C_d}$ of free-rising sphere is unstable, and the variation is intense. This instability could be attributed to transitional flow regimes where both viscous and inertial forces compete, leading to fluctuating flow patterns and wake structures around the sphere. Compared to the free-falling sphere experiment result (see Figure 3.1), free-rising spherical particles are affected by the influence, such as vortex shedding, more easily in transitional flow regimes where Reynolds number is from 200 to 400.

3.3.2 Comparison of Particle Drag Coefficient in two motion models

The constant $\mathrm{C_d}$ value either conducted from experiment nor predicted by new $\mathrm{C_d}$-Re model for free-rising spherical particles is larger than that from the traditional model represented by the Haider-Levenspiel model, which is consistent with the phenomena presented in Karamanev's paper (Karamanev et al., 1996) and Veldhuis's paper (Veldhuis et al., 2009).

In the past, experiment data for establishment of drag coefficient models were based on free-falling particles test (particle settling test), glass bead particles, metal particles, and zeolite particles were mostly used. The density of these type of particles is much larger than the density of fluid medium. For these heavy spherical particles, the direction of motion during the settling experiment is mainly affected by gravity. When a particle falls through a fluid, it indeed creates a wake and experience vortex shedding, where vortices form and separate from the tail of the particle. These forces are relatively small and negligible in magnitude compared to gravity for heavy particles. So that heavy particles fall almost vertically, with minimal deviation caused by wake dynamics. Thus, the drag force of heavy particle can be simply calculated through the particle velocity measured form experiments and the accuracy of the drag coefficient model is well.

For free-rising sphere particles, their mass is relatively smaller compared to the heavy particles. For light particles, the gravity force is minimal compared to heavy particles, making them more sensitive to the effects of wake vortex and other hydrodynamic forces. The forces generated during vortex shedding and wake dynamics have a significant impact on the motion of light particles. The drag force needs to be separated into two parts: primary drag force caused by the particle motion, and additional drag force caused by the vortex shedding. As a free-rising particle moves upward, it experiences a primary drag force which is a result of the resistance offered by the fluid medium to the particle's motion. Vortex shedding occurs at the rear of the particle, creating a secondary drag component that fluctuates as vortices are periodically shed. For light particles with small mass, the combined effects of primary drag force and additional drag forces from vortex shedding result in a greater and more complex net drag force. This coupling of forces leads to larger C_d and non-linear, erratic trajectories that are difficult to predict.

3.4 Conclusions

The result of this chapter presents new drag coefficient model for free-rising spherical particles. Several materials in different liquid system were measured to cover a wide range of Reynolds number from 70 to 1400. The results of free-falling spherical particles in fresh water validate that the standard drag coefficient model can be conducted to predict C_d for free-rising sphere.

A drag coefficient model with five parameters is developed based on the classical drag coefficient models. The validation with free-falling particles and the consistency of a constant C_d value at higher Reynolds numbers further strengthen the model's reliability. For free-rising spherical particles, the new model predicted the drag coefficient more accurately than the traditional model represented by the Haider-Levenspiel model in lower Reynolds number region. The drag coefficient is considered to be constant and equal to 0.95 at higher Reynolds number. A proper explanation is given for the constant drag difference between free-falling spherical particles and free-rising spherical particles.

Chapter 4 Movement of free-rising spherical particles

4.1 Introduction

In the study of drag coefficient through particle settling experiments with free-falling heavy spherical particles, gravity is the dominant force influencing their motion. Despite the formation of a wake behind the particle and the occurrence of vortex shedding as it moves through the fluid, these forces are relatively minor compared to the gravitational pull. As a result, free-falling particles tend to move almost vertically, with only minimal deviations caused by wake dynamics.

Conversely, free-rising spheres, due to their relatively small mass, experience a minimal gravitational force. This makes them more susceptible to wake vortex effects and other hydrodynamic forces. During vortex shedding, an additional fluctuating force acts on the particle as vortices are periodically shed. The combined effects of drag force and these fluctuating forces result in a more complex and greater net drag force, leading to non-linear and erratic trajectories.

The movement of spherical particles, whether in a free-falling model or free-rising model, can be separated into two stages.

Accelerating stag, where the velocity of spherical particle increases until it reaches its terminal velocity, while the acceleration of the particle decreases to near zero over a relatively short pathing distance. This stage is characterized by rapid changes in velocity and deceleration of acceleration.

Stable stage, where the velocity of the sphere remains constant for free-falling spherical particle or sustained cyclical oscillations for free-rising spheres once the terminal velocity is reached. The drag forces, buoyancy, gravity force and vortex shedding force (for free-rising spheres) are balanced. During this stage, the particle maintains a steady motion, assuming no additional external forces act upon it.

During the particle acceleration to terminal velocity, it experiences instability, and both history forces and added mass forces are present. These forces decrease to zero once the particle reaches terminal velocity and enters the stable stage (Kalman & Portnikov, 2023). Thus, the movement of accelerating stage of the particle is ignored in this chapter. The focus is on analyzing the movement of spherical particles when they enter the stable stage, which would help to understand the particle-fluid interactions for most fluidized bed reactors or processes with fluidization.

4.2 Experimental Details

To analyze the detailed motion behavior of free-rising spherical particles made from different materials and within various fluid mediums, high-speed cameras are employed to capture their movements. High-speed imaging at 2500 frames per second, along with advanced image acquisition and tracking analysis systems such as Tracker Analysis software, facilitates a comprehensive examination of the movement behavior of both free-rising and free-falling spherical particles in liquid systems.

This methodology provides extensive data on particle trajectories and allows for the separation of velocities into vertical (y-axis) and horizontal (x-axis) directions for further analysis. This enhances the understanding of particle-fluid interactions in detail.

Analysis mainly focuses on the movement phenomena of free-rising spherical particles and compares the motion models of both free-rising and free-falling spherical particles in this study. Experiments involving free-falling spherical particles were conducted to achieve a comprehensive understanding of the motion behaviors in both scenarios. High-speed imaging and detailed analysis of velocities offer valuable insights into particle-fluid interactions.

In order to facilitate the analysis and comparison of the experimental data, the experimental data of each particle in the steady-state segment were extracted and subjected to a re-zeroing operation. Movement analysis of spherical particles with different materials and size in different fluid medium are divided into four groups：

1) Free-falling sphere
2) Free-rising sphere with low-density-difference
3) Free-rising sphere with mid-density-difference
4) Free-rising sphere with high-density-difference

4.2.1 Movement of free-falling spheres

Particle properties and liquid properties of free-falling sphere for settling experiment in fresh water is presented in Table 4.1. Density ratio $\bar{\rho}$ of PP particles ranges around at 1.4. The density ratio $\bar{\rho}$ of PP particles ranges around at 1.1, close to the density of fresh water.

Table 4.1 Particle properties and liquid properties of free-falling spheres

Code	d_p, mm	ρ_p, kg/m^3	ρ_f, kg/m^3	$\bar{\rho} = \rho_p/\rho_f$
PP-2.494-FW	2.494	1389.3	999.9	1.39
PP-3.478-FW	3.478	1424.8	999.9	1.42
PMMA-1.984-FW	1.984	1100.4	999.9	1.10
PMMA-2.757-FW	2.757	1099.7	999.9	1.10
PMMA-3.553-FW	3.553	1085.9	999.9	1.09

The particle velocities in vertical (y-axis) and horizontal (x-axis) directions are shown in Figure 4.1 (a) for PP spherical particles and (b) for PMMA spherical particles.

From Figure 4.1 (a) and (b), it is evident that the vertical component of velocity v_y is the primary motion observed during the fall of the particles while the horizontal component v_x is nearly negligible across the settling tests of free-falling spherical particles. The density ratio $\bar{\rho}$ is a crucial factor in determining the settling velocity. Higher density ratio $\bar{\rho}$ for PP particles lead to faster settling compared to PMMA particles with lower $\bar{\rho}$.

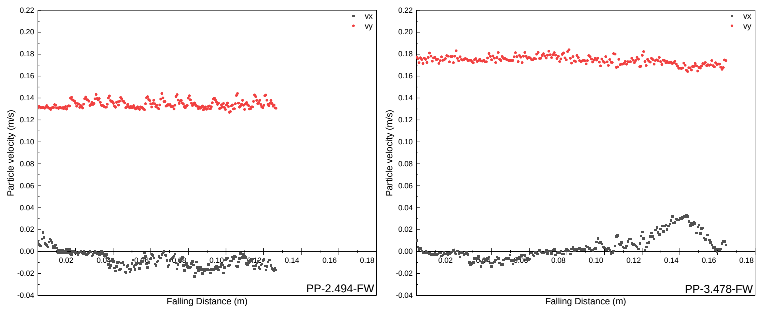


Figure 4.1 (a) Free-falling PP spheres in Fresh Water

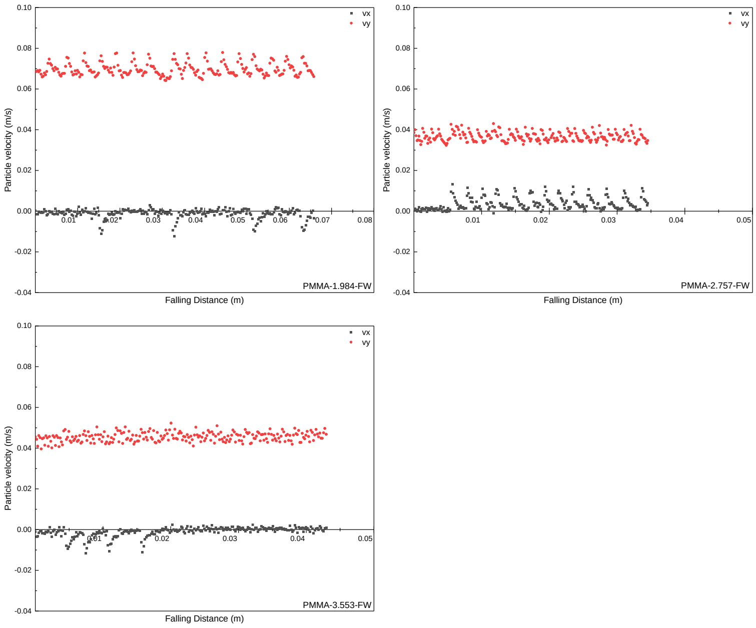


Figure 4.1 (b) Free-falling PMMA spheres in Fresh Water

However, for the PMMA spheres, the actual vertical particle velocity does not fit a straight line as expected. Periodic oscillations of velocity occur during the particle settling. This indicates that there may be additional factors, affecting the settling process for PMMA spheres, which will be discussed later.

4.2.2 Movement of free-rising spheres with low-density-difference

Particle properties and liquid properties of free-rising sphere with low-density-difference in different fluid medium are presented in Table 4.2. As the density ratio$\bar{\rho}$ closer to 1, the lower the density difference is for the free-rising sphere. Density ratio $\bar{\rho}$ ranges from 0.75 to 0.95 is classified as free-rising spherical particles with low-density-difference in this study.

Table 4.2 Particle properties of free-rising spheres with low-density-difference $\bar{\rho}$

Code	d_p, mm	ρ_p, kg/m^3	ρ_f, kg/m^3	$\bar{\rho} = \rho_p/\rho_f$
PP-2.435-FW	2.435	794.1	999.9	0.79
PP-3.050-FW	3.050	875.4	999.9	0.88
PP-2.474-SW	2.474	882.6	1157.4	0.76
PP-3.059-SW	3.059	1000.8	1157.4	0.87
PMMA-2.812-SW	2.812	1031.2	1157.4	0.89
PMMA-3.514-SW	3.514	1100.4	1157.4	0.95

The particle velocities in vertical (y-axis) and horizontal (x-axis) directions are shown in Figure 4.2 (a) for PP spherical particles and (b) for PMMA spherical particles.

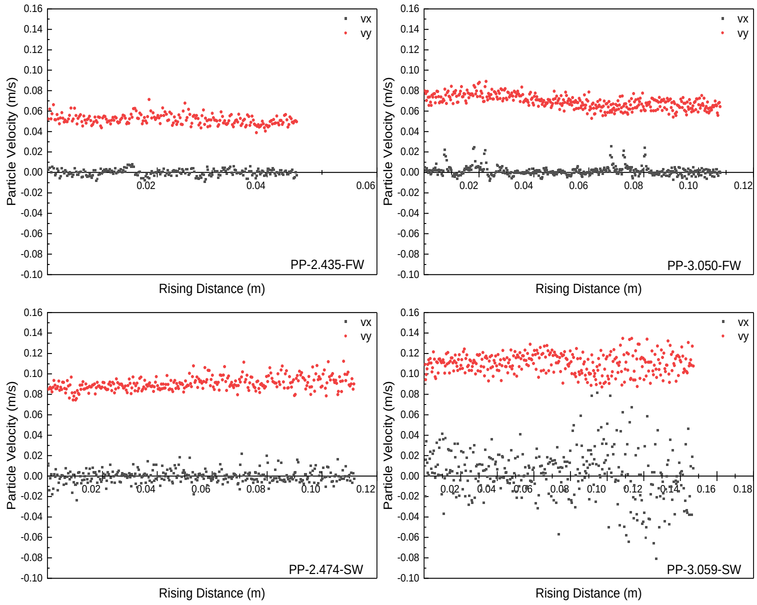


Figure 4.2 (a) Free-rising PP spheres with low-density-difference $\bar{\rho}$

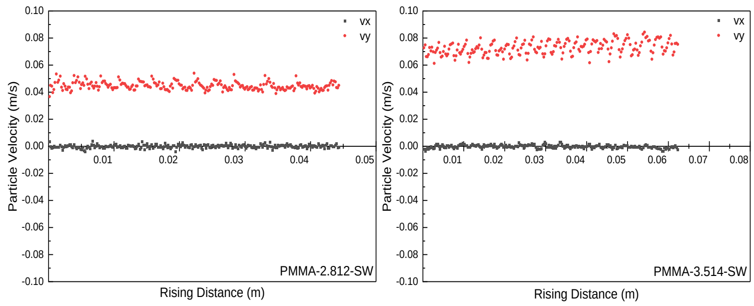


Figure 4.2 (b) Free-rising PMMA spheres with low-density-difference $\bar{\rho}$

From Figure 4.2 (a) and (b), it is evident that the rising behavior of particles with low-density-difference in a fluid medium is primarily governed by their vertical velocity component, density ratio, and size, with lower density differences and larger particles rising more rapidly.

Similar to the settling tests, free-rising PMMA spheres exhibit periodic oscillations in their vertical velocity, indicating additional fluid dynamics interactions during the rising motion. These phenomena, periodic oscillations for particles with mass density close to the fluid medium (density ratio $\bar{\rho}$ ranges from 0.9 to 1.1), will be discussed later.

4.2.3 Movement of free-rising spheres with mid-density-difference

Particle properties and liquid properties of free-rising sphere with mid-density-difference in different fluid medium are presented in Table 4.3. Density ratio $\bar{\rho}$ ranges from 0.3 to 0.7 is classified as free-rising spherical particles with mid-density-difference in this study.

Table 4.3 Particle properties of free-rising spheres with mid-density-difference $\bar{\rho}$

Code	d_p, mm	ρ_p, kg/m^3	ρ_f, kg/m^3	$\bar{\rho} = \rho_p/\rho_f$
PP-2.031-FW	2.031	456.2	999.9	0.46
PP-3.211-FW	3.211	692.5	999.9	0.69
PP-2.030-SW	2.030	456.9	1157.4	0.40
PP-3.228-SW	3.228	738.4	1157.4	0.64
WD-2.561-FW	2.561	455.1	999.9	0.46
WD-5.915-FW	5.915	673.9	999.9	0.67
WD-2.861-SW	2.861	570.8	1157.4	0.49
WD-6.258-SW	6.258	615.7	1157.4	0.53
EPS-S-4.192-FW	4.192	414.8	999.9	0.42
EPS-S-5.503-FW	5.503	343.7	999.9	0.34

The particle velocities in vertical (y-axis) and horizontal (x-axis) directions are shown in Figure 4.3 (a) for PP spherical particles, (b) for Wood spherical particles and (c) for special EPS spherical particles.

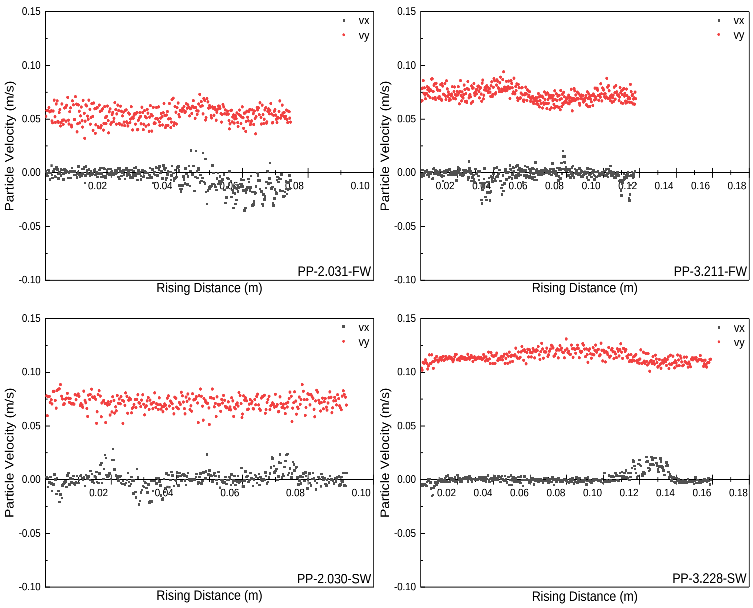


Figure 4.3 (a) Free-rising PP spheres with mid-density-difference $\bar{\rho}$

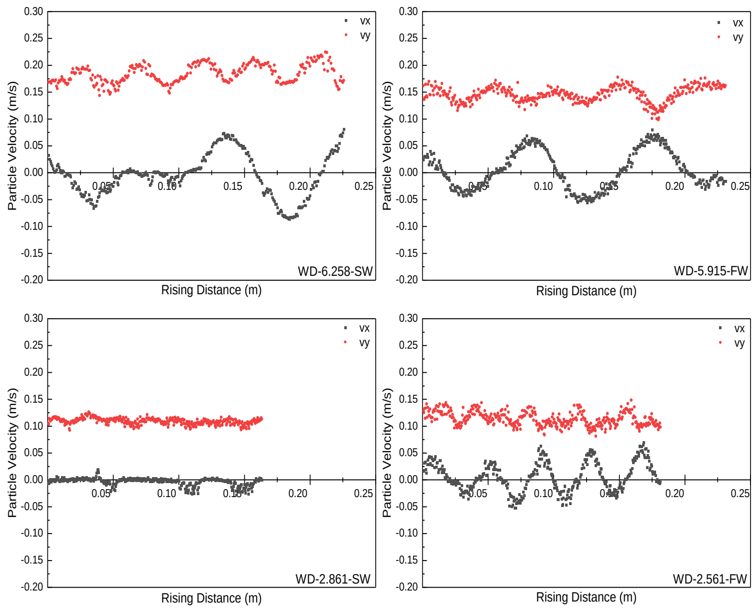


Figure 4.3 (b) Free-rising Wood spheres with mid-density-difference $\overline{\rho}$

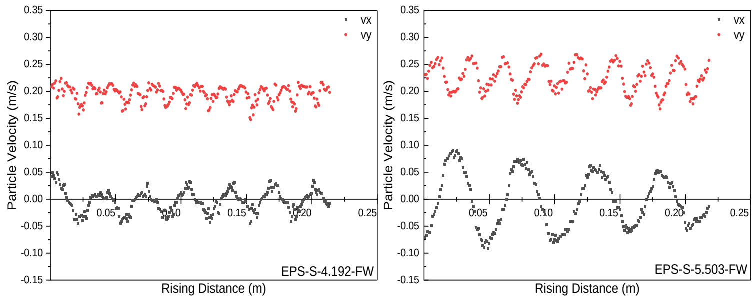


Figure 4.3 (c) Free-rising special EPS spheres with mid-density-difference $\overline{\rho}$

Form the Figure 4.3 (a), (b) and (c), it is evident that part of the rising behavior of free-rising particles with mid-density-difference in a fluid medium is similar to the one of free-rising particle with low-density difference, with lower density differences and larger particles rising more rapidly.

The movement regime of free-rising particles with mid-density-difference is complex, with PP spheres exhibiting minimal oscillations in either direction, similar to that of particles with low-density-difference, while wood and specialized EPS particles show significant oscillations in both directions. With the particle diameter increase, the oscillations of particle velocity in horizontal direction (v_x) is more pronounced. Moreover, the particle velocity in the vertical direction v_y and the horizontal direction v_x are related such that v_y oscillates twice for every oscillation of v_x.

4.2.4 Movement of free-rising spheres with high-density-difference

Particle properties and liquid properties of free-rising sphere with high-density-difference in different fluid medium are presented in Table 4.4. Density ratio $\bar{\rho}$ ranges lower than 0.1 is classified as free-rising spherical particles with high-density-difference in this study.

Table 4.4 Particle properties of free-rising spheres with high-density-difference $\bar{\rho}$

Code	d_p, mm	ρ_p, kg/m^3	ρ_f, kg/m^3	$\bar{\rho} = \rho_p/\rho_f$
EPS-2.369-FW	2.369	18.0	999.9	0.02
EPS-2.625-FW	2.625	18.0	999.9	0.02
EPS-3.091-FW	3.091	18.0	999.9	0.02
EPS-3.636-FW	3.636	18.0	999.9	0.02
EPS-4.752-FW	4.752	18.0	999.9	0.02
EPS-5.430-FW	5.430	18.0	999.9	0.02
EPS-6.197-FW	6.197	18.0	999.9	0.02
EPS-2.395-SW	2.395	18.0	1157.4	0.02
EPS-3.353-SW	3.353	18.0	1157.4	0.02
EPS-5.078-SW	5.078	18.0	1157.4	0.02
EPS-5.240-SW	5.240	18.0	1157.4	0.02
EPS-6.077-SW	6.077	18.0	1157.4	0.02

The particle velocities in vertical (y-axis) and horizontal (x-axis) directions are shown in Figure 4.4 (a) for EPS spherical particles in salted water, (b) for EPS spherical particles in fresh water.

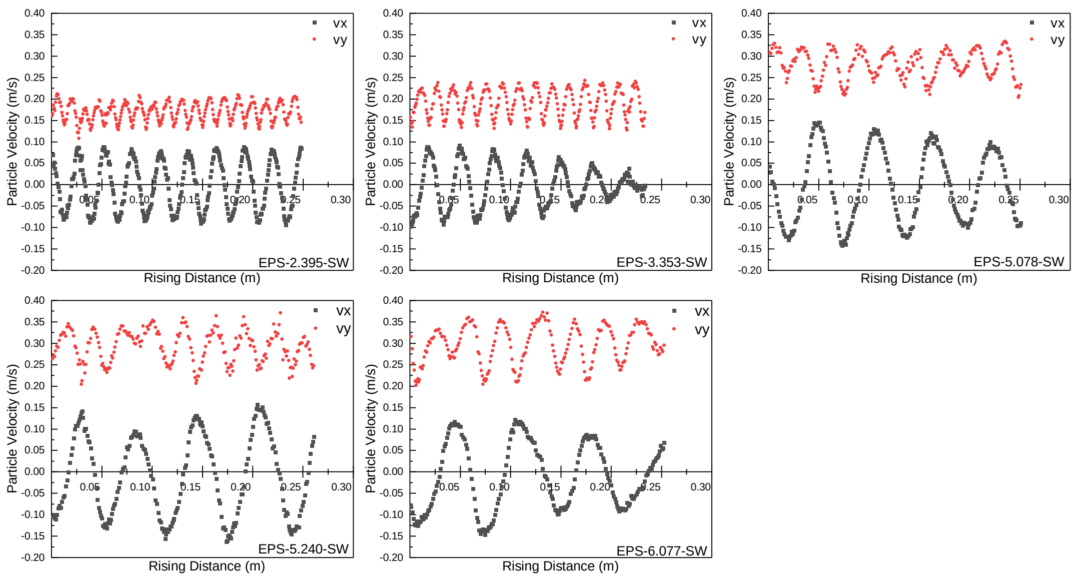


Figure 4.4 (a) Free-rising EPS spheres with high-density-difference $\bar{\rho}$ in SW

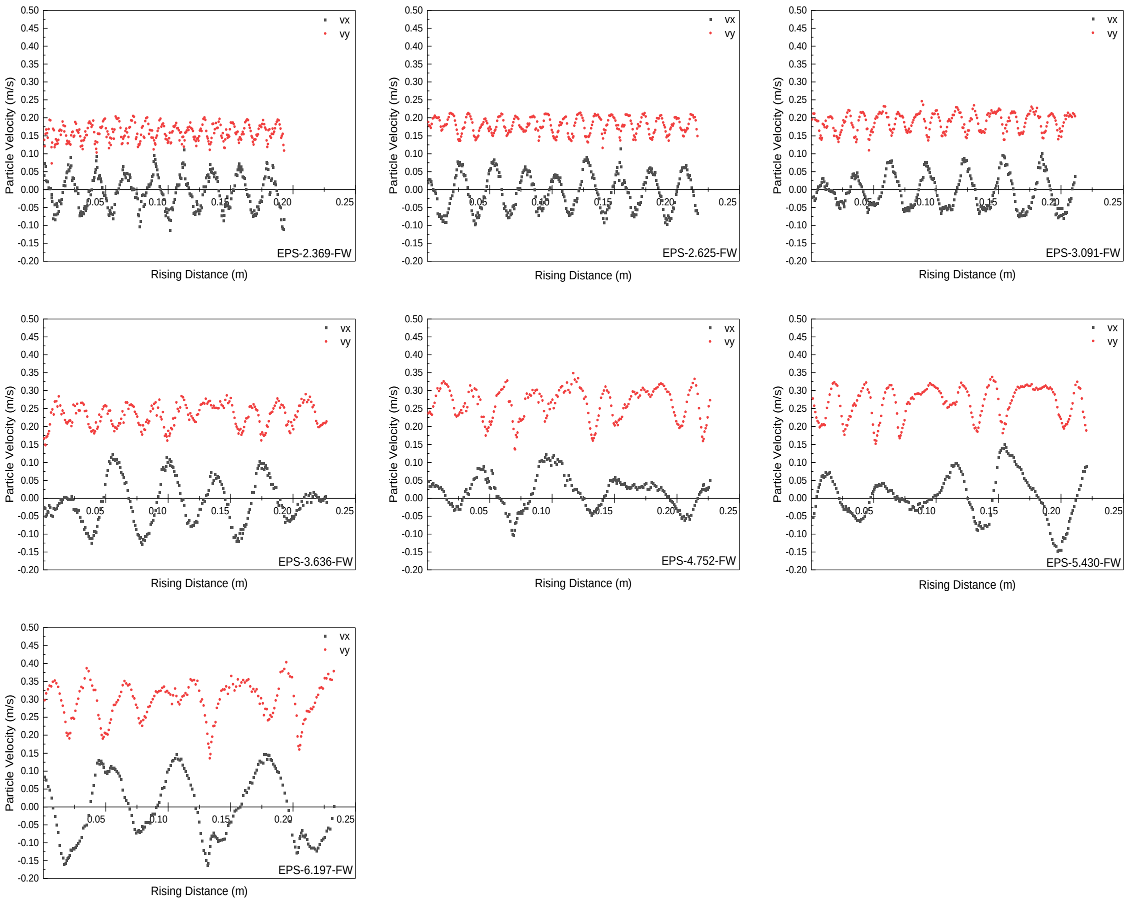


Figure 4.4 (b) Free-rising EPS spheres with high-density-difference $\overline{\rho}$ in FW

From Figure 4.4 (a) and (b), it is evident that basic rising behavior tendence of free-rising particles with high-density-difference $\overline{\rho}$ in a fluid medium is similar to the result mentioned before, with lower density differences and larger particles rising more rapidly.

The movement of free-rising particles with high-density differences is simple and clear, similar to free-rising Wood and specialized EPS particles with mid-density-difference, significant oscillations in both directions occur. With the particle diameter increase, the oscillations of particle velocity in horizontal direction (v_x) is more pronounced. Moreover, the particle velocity in the vertical direction v_y and the horizontal direction v_x are related such that v_y oscillates twice for every oscillation of v_x.

4.3 Results and discussion

Combined the Figure of particle velocity in two directions vs. particle falling or rising distance with the 2D high-speed video image of the movement of the spherical particles in liquid fluid medium, the 2D trajectory result of the spherical particles in both motion models from the experiment is similar to the one conducted by Raaghav et al. (Raaghav et al.,2022):

- Steady vertical path for free-falling sphere with higher density ratio $\bar{\rho}$ near to 1.5.
- Intermittent vertical path for sphere with density ratio $\bar{\rho}$ near to 1 ($\bar{\rho}$ from 0.9 to 1.1).
- Hybrid movement for free-rising sphere in mid-density-difference region.
- Low frequency oscillating zigzagging path for free-rising high-density-difference sphere with larger particle size.
- High frequency oscillating zigzagging path for free-rising high-density-difference sphere with smaller particle size.

Discussion for the phenomena of spherical particle in liquid fluid medium is divided into three parts:

- Movement of PMMA sphere in different motion models: free-falling motion model and free-rising motion model.
- Movement of free-rising sphere in the mid-density-difference region
- Movement of free-rising sphere with high-density-difference.

4.3.1 Movement of PMMA spheres in different motion models

In the experiments involving free-falling PMMA spherical particles in fresh water and free-rising ones in salted water, a notable phenomenon is observed where the spheres exhibit periodic oscillations in their vertical velocity. This behavior can be explained by analyzing the force difference between the gravity force and the buoyancy force acting on the spheres, as described by the following Equation 4.1.

$$F_{\Delta BG} = \left|F_{Gravity} - F_{Buoyancy}\right| = \frac{\pi}{6} d_p^3 \left|\rho_p - \rho_f\right| g \quad (4.1)$$

From Equation 4.1, combined with the Equation 3.3 and 3.4 from Chapter 3, the key parameter influencing the force difference $F_{\Delta BG}$ is the absolute density difference $\Delta\rho = \left|\rho_p - \rho_f\right|$. The smaller the absolute density difference $\Delta\rho$, the closer the density ratio $\bar{\rho}$ is to 1, leading to a smaller gap between the gravity force and the buoyancy force and quicker achievement of balance between these two forces.

When the spherical particle rapidly achieves this force balance with the surrounding fluid medium, the drag force becomes smaller and more responsive to changes in fluid dynamics, such as vortex shedding. Vortex shedding occurs periodically, causing periodic variations in the drag force experienced by the particle. This, in turn, leads to periodic oscillations in the particle's velocity as it moves through the fluid. The sensitivity of the drag force to fluid dynamics variations is a crucial factor contributing to the observed oscillatory behavior.

4.3.2 Movement of free-rising spheres with mid-density-difference

In the experiment involving free-rising spherical particles with mid-density difference, two distinct motion models are observed. For free-rising PP spheres in either fresh water or salted water, the movement model resembles that of PP spheres with a low-density difference.

However, for free-rising wood particles, the movement enters an oscillating zigzagging zone. In this zone, the particle's velocity in the vertical direction v_y and the horizontal direction v_x are related such that v_y oscillates twice for every oscillation of v_x, except for the case of Wd-2.861-SW, which exhibits a movement pattern similar to free-rising PP materials with either low or mid-density differences.

This oscillating zigzagging movement phenomenon is also observed in specialized EPS spheres during free-rising experiments, but the frequency of particle velocity oscillation in both directions is much higher than that of the wood particles. The oscillation frequency of the EPS spheres is similar to that of free-rising EPS spheres with high-density difference.

Motion models in the mid-density-difference region are hybrid, incorporating characteristics observed from both low-density-difference and high-density-difference spheres. This indicates that in this region, a transition of forces that influence particle movement occurs. Buoyancy force is no longer the main force affecting sphere rising; instead, it competes with forces caused by vortex shedding. This hybrid motion model in the mid-density-difference region highlights the transitional nature of particle-influenced forces, combining elements from both ends of the density-difference spectrum.

4.3.3 Movement of free-rising spheres with high-density-difference.

In the experiment involving free-rising spherical particles with high-density difference, two zigzagging motion models with different frequencies are observed. For free-rising EPS spheres with diameters smaller than 4 mm, the oscillation frequency of particle velocity in both direction is higher and more regular compared to EPS spheres with larger diameters.

In salted water, the amplitude variations of particle velocities in the vertical and horizontal directions are more regular, with nearly equal intervals between cycles, leading to more predictable oscillations in particle velocities. In contrast, in freshwater, more irregularities in the oscillations of particle velocities occur, especially for larger particles such as EPS-5.430-FW and EPS-6.197-FW. The amplitude variations of particle velocities in both vertical and horizontal directions become increasingly irregular with larger particle sizes, leading to increased inequality in the inter-periodic intervals of their velocity oscillations.

However, the periodic relationship between vertical and horizontal velocities, where v_y oscillates twice for every oscillation of v_x, indicates that the particles are still responding to force influences such as vortex shedding in a predictable manner, despite the irregular amplitude variations. This suggests that while the overall pattern remains governed by vortex shedding, the irregularities in amplitude variations are more pronounced with increasing particle size and fluid medium changing conditions. Thus, a relationship model may can be given for particle velocity in both vertical and horizontal direction.

4.4 Conclusions

The study of the movement of free-rising and free-falling spherical particles in different fluid mediums provides significant insights into particle-fluid interactions.

Free-falling particles, influenced predominantly by gravitational forces and mechanical inertial force, exhibit primarily vertical trajectories with minimal horizontal deviations. The density ratio $\bar{\rho}$ is a critical factor determining the settling velocity, with higher density ratios resulting in faster settling.

Free-rising particles experience more complex motion due to the minimal gravitational force acting on them, making them more susceptible to hydrodynamic forces and vortex shedding. This leads to non-linear and erratic trajectories characterized by fluctuating forces and greater net drag.

Spheres with density ratio $\bar{\rho}$ near to 1, both in free-falling and free-rising models, exhibit periodic oscillations in their vertical velocity. This behavior is attributed to the small density difference between the particle and the fluid, causing rapid force balance and sensitivity to fluid dynamics variations like vortex shedding.

Density-Difference Impact on Free-Rising Particles:

- Low-Density-Difference Spheres: Lower density differences lead to simpler, primarily vertical rising behavior with occasional periodic oscillations.
- Mid-Density-Difference Spheres: Movement is hybrid, combining characteristics of both low and high-density-difference spheres. Free-rising wood and EPS particles in this category show significant oscillations, with velocity oscillations in both directions.
- High-Density-Difference Spheres: Significant oscillations in both directions, with higher frequency and more regular patterns in smaller particles. Larger particles exhibit more irregular amplitude variations in freshwater.

From previous chapters, it is clear that both density difference ratio and flow regime of the particle affected the particle movement phenomena. When the density difference ratio between the particle and the fluid is extremely small, such as the EPS spheres, the influence on the free-rising spheres movement caused by transforming of flow regime is no longer excited, from wide range of the Reynolds number region, the spheres move in a regular zigzagging path. In another situation, when the density difference ratio is near to 1, both free-rising spheres and free-falling spheres laid in the steady axisymmetric flow regime ($20 \leq Re_T \leq 210$) and both move in an intermittent vertical path, density difference dominance the movement of the particle.

Despite the irregularities, a predictable relationship exists between vertical and horizontal velocities in high-density-difference particles, where v_y oscillates twice for every oscillation of v_x. This indicates a continued response to vortex shedding forces.

The comprehensive analysis of particle trajectories and velocities, facilitated by high-speed imaging and advanced tracking systems, enhances the understanding of particle-fluid interactions. These findings have practical implications for processes involving fluidized beds and other fluidization applications, providing a foundation for optimizing such systems based on particle dynamics.

Chapter 5 Conclusions and Recommendations

5.1 General Conclusions

A drag coefficient model with five parameters for Reynolds number from 70 to 1400 is developed based on the classical drag coefficient models. The validation with free-falling particles and the consistency of a constant C_d value at higher Reynolds numbers further strengthen the model's reliability.

For free-rising spherical particles, the new model predicted the drag coefficient more accurately than the traditional model represented by the Haider-Levenspiel model in lower Reynolds number region. The drag coefficient is considered to be constant and equal to 0.95 at higher Reynolds number. A proper explanation is given for the constant drag difference between free-falling spherical particles and free-rising spherical particles.

Spheres with density ratio $\bar{\rho}$ near to 1, both in free-falling and free-rising models, exhibit periodic oscillations in their vertical velocity. This behavior is attributed to the small density difference between the particle and the fluid, causing rapid force balance and sensitivity to fluid dynamics variations like vortex shedding.

Free-falling particles, influenced predominantly by gravitational forces, exhibit primarily vertical trajectories with minimal horizontal deviations. The density ratio $\bar{\rho}$ is a critical factor determining the settling velocity, with higher density ratios resulting in faster settling.

Free-rising particles experience more complex motion due to the minimal gravitational force acting on them, making them more susceptible to hydrodynamic forces and vortex shedding. This leads to non-linear and erratic trajectories characterized by fluctuating forces and greater net drag. Density-difference impact on free-rising spherical particles:

- Mid-Density-Difference Spheres: Movement is hybrid, combining characteristics of both low and high-density-difference spheres. Free-rising wood and EPS particles in this category show significant oscillations, with velocity oscillations in both directions.
- High-Density-Difference Spheres: Significant oscillations in both directions, with higher frequency and more regular patterns in smaller particles.

Despite the irregularities, a predictable relationship exists between vertical and horizontal velocities in high-density-difference particles, where v_y oscillates twice for every oscillation of v_x. This indicates a continued response to vortex shedding forces.

5.2 Recommendations

In further research, the proposed method can be extended to other liquid fluid medium systems with free-rising particles of different sizes and particle mass densities. This work has focused on the drag coefficient of free-rising particles and their movement phenomena, considering only two parameters of particle properties: particle size and particle mass density, in a static low-viscosity Newtonian liquid. To gain a comprehensive understanding of particle-fluid interactions, future studies should also investigate other properties of particles, such as particle shape and surface roughness, and properties of the fluid medium, such as viscosity and non-Newtonian behavior.

To achieve this, statistical and computational models can be employed to predict particle behavior under various conditions. Specifically, a brief relationship model, between the particle velocity in vertical and horizontal directions for free-rising particle with density difference ratio $\bar{\rho}$ smaller than 0.5 is given, based on the result from this study on movement of free-rising sphere with velocity oscillation in both directions. The equations for free-rising particle velocity, incorporating functions that describe the irregular amplitude variations over time, are shown below:

- Vertical direction: $v_y(t) = A_y \sin\left(2\omega t + \phi_y\right)$ with $A_y(t) = A_{y0} + f_y(t)$
- Horizontal direction: $v_x(t) = A_x \sin(\omega t + \phi_x)$ with $A_x(t) = A_{x0} + f_x(t)$

This model should be validated with large-scale experiments with variety of light particles and different liquid fluid medium to ensure accuracy.

Moreover, it is crucial to study particle movement under dynamic conditions, such as varying fluid flow rates, pulsating flows, or turbulent conditions. This will provide a more precise understanding of how particles behave in real-world scenarios and enhance the applicability of the research findings.

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Appendices

List of Nomenclature for Appendices

Nomenclature

d_p	Particle mean diameter, mm
σ	Standard deviation
ρ_p	Particle density, kg/m^3
$\bar{\rho}$	Density difference ratio
Ar	Archimedes Number
u_T	Particle terminal velocity, m/s
Re_T	Terminal Reynolds Number
C_d	Drag coefficient
x	Particle position in horizontal direction, m
y	Particle position in vertical direction, m
v_x	Particle velocity in horizontal direction, m/s
v_y	Particle velocity in vertical direction, m/s

Nomenclature

PP	Polypropylene
PMMA	Polymethyl methacrylate
EPS	Expanded Polystyrene
WD	Wood
FW	Fesh Water
SW	Salted Water
S	Specialized
R	Right side
L	Left side

Particle code naming rules

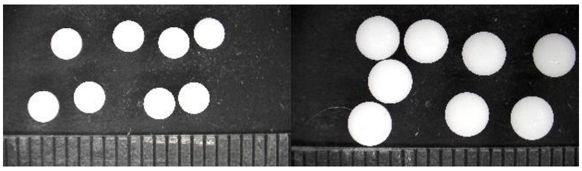
Material – Particle diameter – Fluid Medium

Example: PMMA-3.514-SW

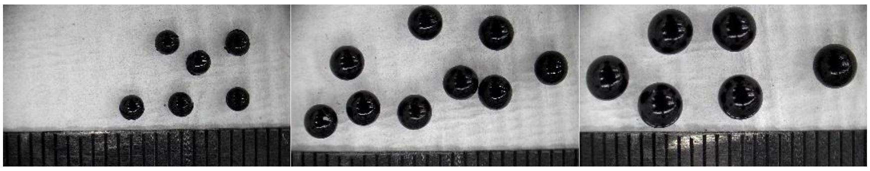
Material – Specialized – Particle diameter – Fluid Medium

Example: EPS-S-5.503-FW

Appendix A1. Imaging of spherical particles under a microscope

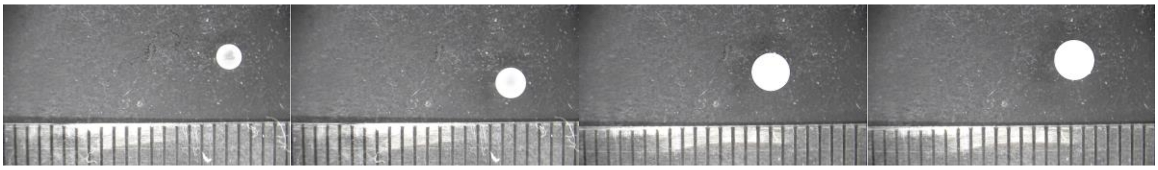


PP-2.494-FW **PP-3.478-FW**

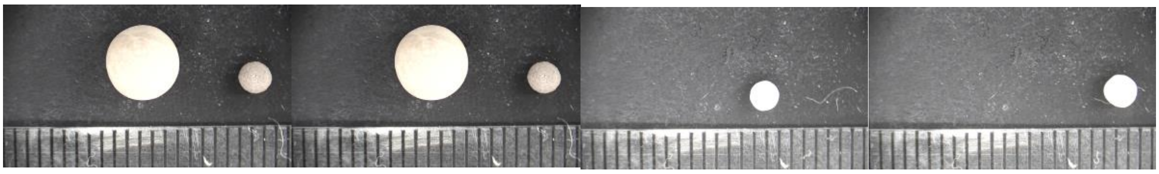


PMMA-1.984-FW **PMMA-2.757-FW** **PMMA-3.553-FW**

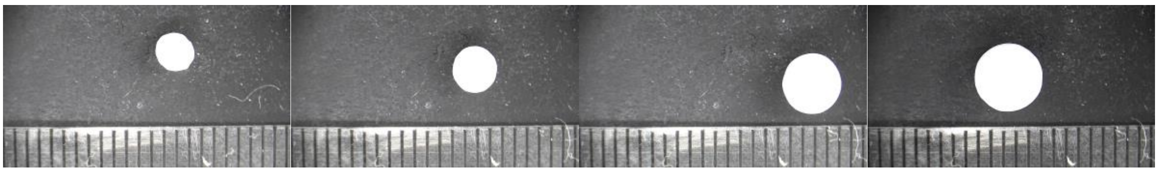
Figure A1.1 Imaging of free-falling spherical particles in freshwater



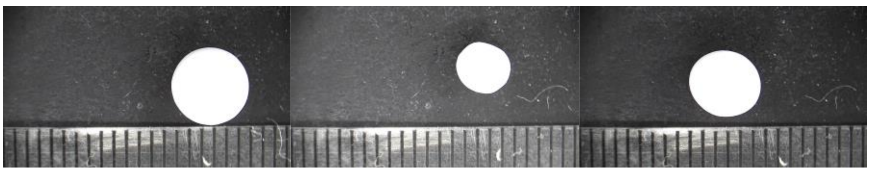
PP-2.031-FW **PP-2.435-FW** **PP-3.050-FW** **PP-3.211-FW**



WD-2.561-FW [R] **WD-5.915-FW [L]** **EPS-2.369-FW;** **EPS-2.625-FW**

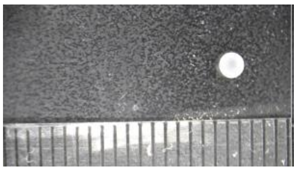


EPS-3.091-FW **EPS-3.636-FW** **EPS-4.752-FW** **EPS-5.430-FW**

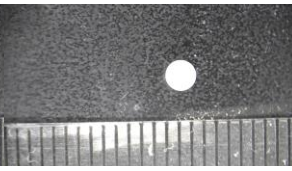


EPS-6.197-FW **EPS-S-4.192-FW** **EPS-S-5.503-FW**

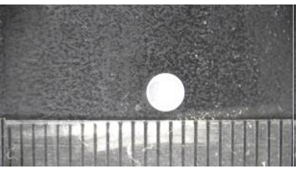
Figure A1.2 Imaging of free-rising spherical particles in fresh water



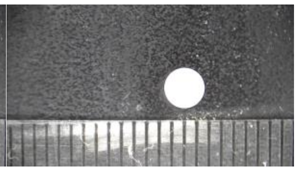
PP-2.030-SW



PP-2.474-SW

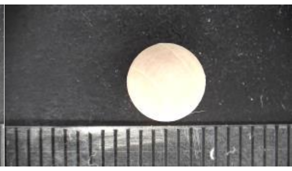


PP-3.059-SW



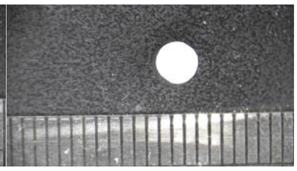
PP-3.228-SW

WD-2.861-SW

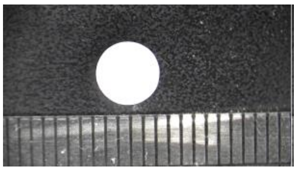


WD-6.258-SW

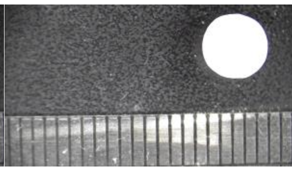
EPS-2.395-SW



EPS-3.353-SW

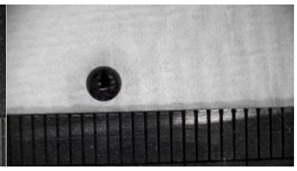


EPS-5.078-SW

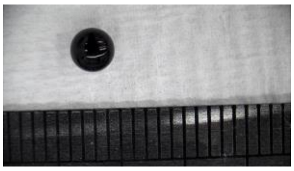


EPS-5.240-SW

EPS-6.077-SW



PMMA-2.812-SW



PMMA-3.514-SW

Figure A1.3 Imaging of free-rising spherical particles in salted water

Appendix A2. Diameter of spherical particles

Table A2.1 Diameter measurement of spherical particles

Code	Material	d_p, mm			Average d_p, mm	σ
		I	II	III		
PP-2.494-FW	PP	2.486	2.504	2.492	2.494	0.9%
PP-3.478-FW	PP	3.482	3.500	3.451	3.478	2.5%
PMMA-3.553-FW	PMMA	3.526	3.557	3.576	3.553	2.5%
PMMA-2.757-FW	PMMA	2.748	2.766	2.758	2.757	0.9%
PMMA-1.984-FW	PMMA	1.967	1.984	2.001	1.984	1.7%
PP-3.211-FW	PP	3.224	3.198	3.210	3.211	1.3%
PP-3.050-FW	PP	2.998	3.098	3.053	3.050	5.0%
PP-2.435-FW	PP	2.426	2.435	2.443	2.435	0.8%
PP-2.031-FW	PP	2.040	2.000	2.052	2.031	2.7%
WD-5.915-FW	Wood-L	5.896	5.923	5.925	5.915	1.6%
WD-2.561-FW	Wood-S	2.523	2.570	2.589	2.561	3.4%
EPS-6.197-FW	EPS	6.197	6.185	6.209	6.197	1.2%
EPS-5.430-FW	EPS	5.437	5.396	5.457	5.430	3.1%
EPS-4.752-FW	EPS	4.740	4.753	4.764	4.752	1.2%
EPS-3.636-FW	EPS	3.646	3.632	3.630	3.636	0.9%
EPS-3.091-FW	EPS	2.633	2.630	2.612	2.625	1.2%
EPS-2.625-FW	EPS	2.398	2.324	2.384	2.369	3.9%
EPS-2.369-FW	EPS	3.060	3.101	3.111	3.091	2.7%
EPS-S-5.503-FW	EPS+Iron	5.497	5.533	5.480	5.503	2.7%
EPS-S-4.192-FW	EPS+Iron	4.203	4.191	4.182	4.192	1.0%
WD-6.258-SW	Wood	6.247	6.260	6.266	6.258	1.0%
WD-2.861-SW	Wood	2.871	2.859	2.853	2.861	0.9%
PP-3.228-SW	PP	3.232	3.224	3.227	3.228	0.4%
PP-3.059-SW	PP	3.053	3.061	3.063	3.059	0.5%
PP-2.474-SW	PP	2.472	2.478	2.473	2.474	0.3%
PP-2.030-SW	PP	2.024	2.032	2.033	2.030	0.5%
EPS-6.077-SW	EPS	6.067	6.083	6.082	6.077	0.9%
EPS-5.240-SW	EPS	5.251	5.284	5.186	5.240	5.0%
EPS-5.078-SW	EPS	5.096	5.072	5.067	5.078	1.6%
EPS-3.353-SW	EPS	3.344	3.361	3.353	3.353	0.9%
EPS-2.395-SW	EPS	2.407	2.388	2.389	2.395	1.1%
PMMA-3.514-SW	PMMA	3.532	3.511	3.499	3.514	1.7%
PMMA-2.812-SW	PMMA	2.832	2.798	2.805	2.812	1.8%

Appendix A3. Properties of spherical particles

Table A3.1 Properties of free-falling spherical particles in fresh water

Code	Material	Fluid Medium	d_p, mm	ρ_p, kg/m^3	$\bar{\rho}$	Ar	u_T, m/s	Re_T	C_d
PP-3.478-FW	PP	Fresh Water	3.478	1424.8	1.43	95968	0.177	455.6	0.62
PP-2.494-FW	PP	Fresh Water	2.494	1389.3	1.39	32448	0.134	247.7	0.71
PMMA-3.553-FW	PMMA	Fresh Water	3.553	1085.9	1.09	20706	0.048	127.4	1.70
PMMA-2.757-FW	PMMA	Fresh Water	2.757	1099.7	1.10	11241	0.037	75.0	2.67
PMMA-1.984-FW	PMMA	Fresh Water	1.984	1100.4	1.10	4216	0.068	100.5	0.56

Table A3.2 Properties free-rising spherical particles in fresh water

Code	Material	Fluid Medium	d_p, mm	ρ_p, kg/m^3	$\bar{\rho}$	Ar	u_T, m/s	Re_T	C_d
PP-3.211-FW	PP	Fresh Water	3.211	692.5	0.69	54645	0.072	170.0	2.52
PP-3.050-FW	PP	Fresh Water	3.050	875.4	0.88	18972	0.067	152.2	1.09
PP-2.435-FW	PP	Fresh Water	2.435	794.1	0.79	15950	0.055	99.2	2.16
PP-2.031-FW	PP	Fresh Water	2.031	456.2	0.46	24446	0.050	74.7	5.83
WD-5.915-FW	Wood	Fresh Water	5.915	673.9	0.67	362288	0.139	609.4	1.30
WD-2.561-FW	Wood	Fresh Water	2.561	455.1	0.46	49123	0.103	196.1	1.70
EPS-6.197-FW	EPS	Fresh Water	6.197	18.0	0.02	1255019	0.287	1315.5	0.97
EPS-5.430-FW	EPS	Fresh Water	5.430	18.0	0.02	844355	0.263	1055.8	1.01
EPS-4.752-FW	EPS	Fresh Water	4.752	18.0	0.02	566010	0.256	900.7	0.93
EPS-3.636-FW	EPS	Fresh Water	3.636	18.0	0.02	253506	0.230	620.0	0.88
EPS-3.091-FW	EPS	Fresh Water	3.091	18.0	0.02	155705	0.185	422.6	1.16
EPS-2.625-FW	EPS	Fresh Water	2.625	18.0	0.02	95370	0.178	345.7	1.06
EPS-2.369-FW	EPS	Fresh Water	2.369	18.0	0.02	70096	0.168	295.1	1.07
EPS-S-5.503-FW	EPS+Iron	Fresh Water	5.503	343.7	0.34	587431	0.216	882.1	1.01
EPS-S-4.192-FW	EPS+Iron	Fresh Water	4.192	414.8	0.41	231504	0.191	594.0	0.88

Table A3.3 Properties of free-rising spherical particles in salted water

Code	Material	Fluid Medium	d_p, mm	ρ_p, kg/m^3	$\bar{\rho}$	Ar	u_T, m/s	Re_T	C_d
PP-3.228-SW	PP	Salted Water	3.228	738.4	0.64	47230	0.111	277.8	1.23
PP-3.059-SW	PP	Salted Water	3.059	1000.8	0.87	135	0.112	263.8	0.43
PP-2.474-SW	PP	Salted Water	2.474	882.6	0.76	9538	0.094	178.7	0.88
PP-2.030-SW	PP	Salted Water	2.030	456.9	0.40	24378	0.072	112.6	3.11
WD-6.258-SW	Wood	Salted Water	6.258	615.7	0.53	505664	0.189	915.3	1.07
WD-2.861-SW	Wood	Salted Water	2.861	570.8	0.49	53968	0.114	252.2	1.45
EPS-6.077-SW	EPS	Salted Water	6.077	18.0	0.02	1183690	0.293	1375.4	0.91
EPS-5.240-SW	EPS	Salted Water	5.240	18.0	0.02	758934	0.284	1148.7	0.84
EPS-5.078-SW	EPS	Salted Water	5.078	18.0	0.02	690622	0.270	1058.2	0.90
EPS-3.353-SW	EPS	Salted Water	3.353	18.0	0.02	198717	0.188	485.7	1.23
EPS-2.395-SW	EPS	Salted Water	2.395	18.0	0.02	72426	0.164	304.2	1.14
PMMA-3.514-SW	PMMA	Salted Water	3.514	1100.4	0.95	23416	0.071	193.9	0.44
PMMA-2.812-SW	PMMA	Salted Water	2.812	1031.2	0.89	3741	0.044	95.4	2.08

Appendix A4. Trajectory of spherical particles

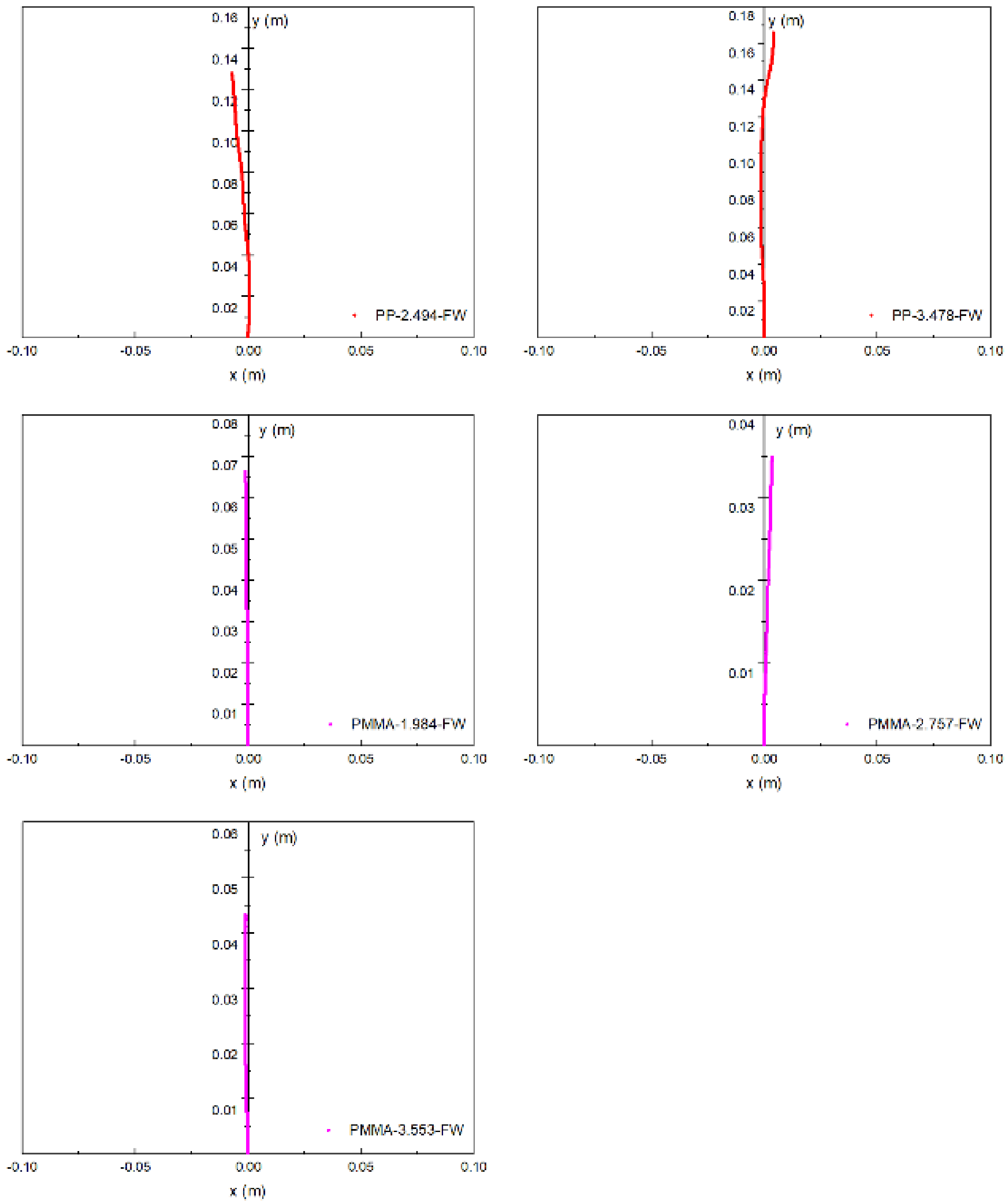


Figure A4.1 Trajectory of free-falling spheres in FW

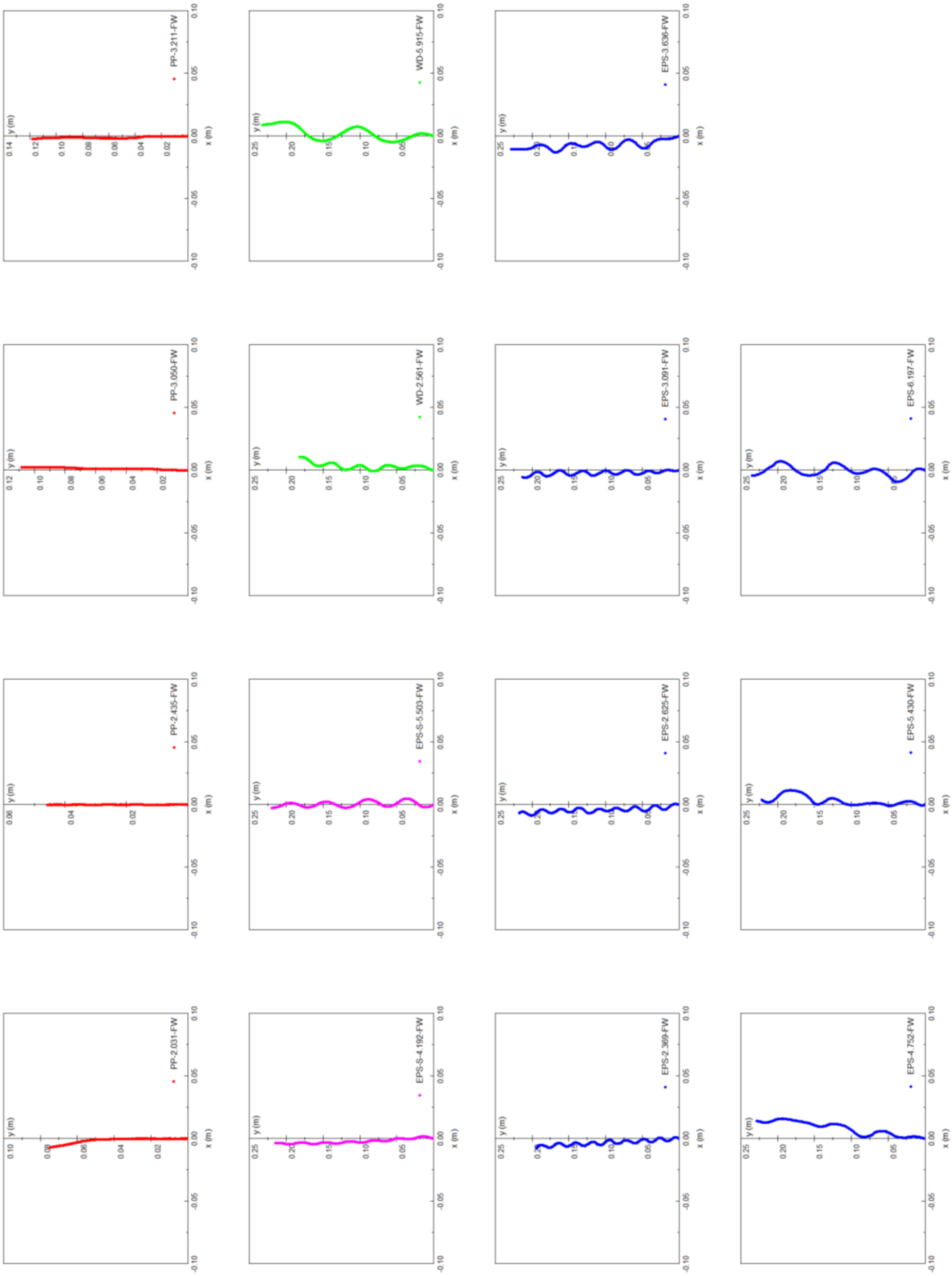


Figure A4.2 Trajectory of free-rising spheres in FW

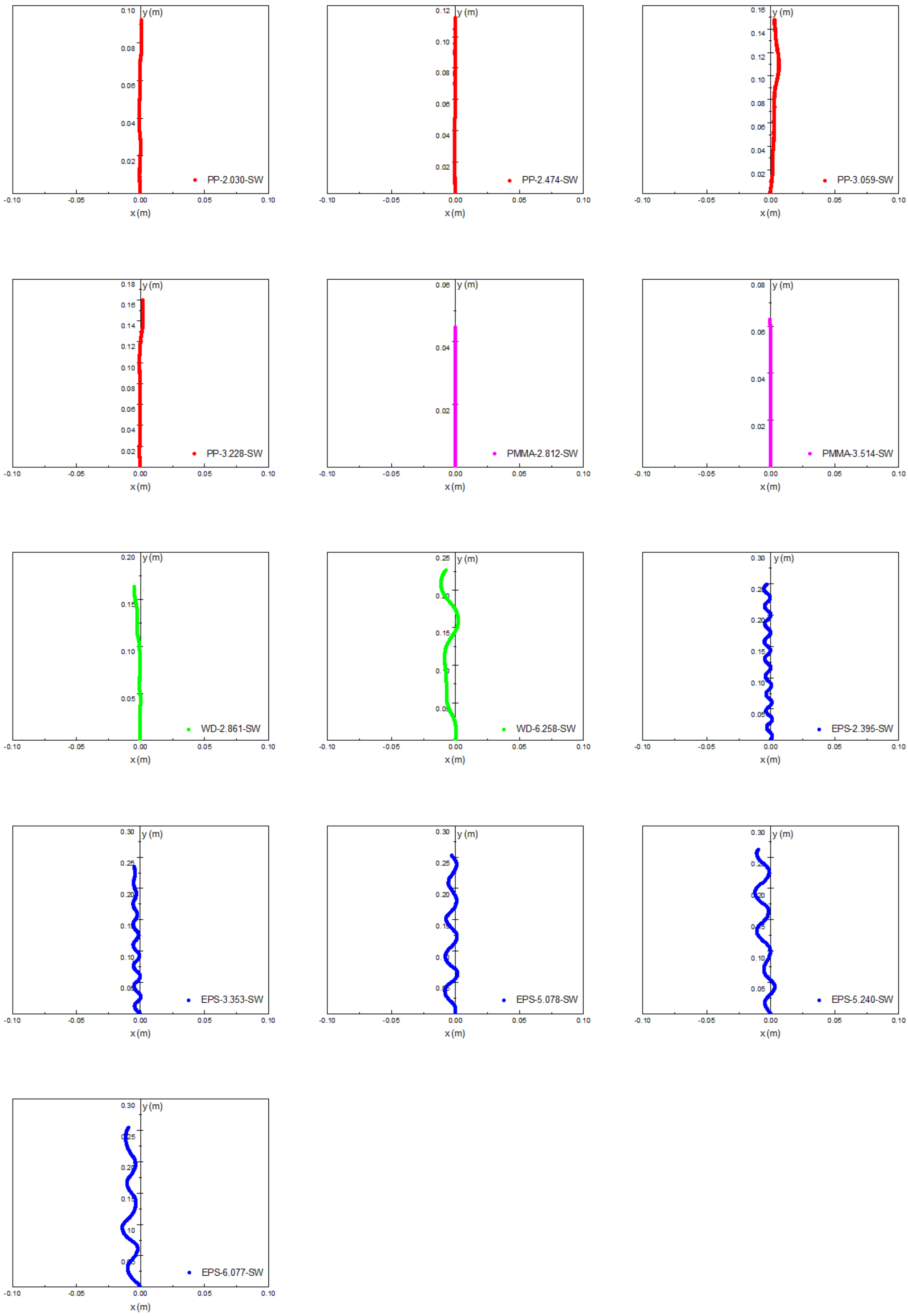


Figure A4.3 Trajectory of free-rising spheres in SW

Appendix B1. Raw data of free-falling spheres in FW

Table B1.1 Raw data of free-falling PP-2.494-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	61	0.0321	0.0005	0.1395	-0.0023
2	0.0005	0.0000	0.1313	0.0084	62	0.0326	0.0005	0.1381	-0.0019
3	0.0011	0.0001	0.1323	0.0066	63	0.0332	0.0005	0.1395	-0.0029
4	0.0016	0.0001	0.1318	0.0058	64	0.0337	0.0005	0.1360	-0.0022
5	0.0021	0.0001	0.1309	0.0050	65	0.0343	0.0005	0.1334	0.0001
6	0.0026	0.0001	0.1312	0.0117	66	0.0348	0.0005	0.1331	-0.0005
7	0.0032	0.0002	0.1316	0.0176	67	0.0353	0.0005	0.1329	-0.0021
8	0.0037	0.0003	0.1311	0.0129	68	0.0358	0.0005	0.1321	-0.0041
9	0.0042	0.0003	0.1307	0.0076	69	0.0364	0.0004	0.1317	-0.0033
10	0.0047	0.0003	0.1315	0.0068	70	0.0369	0.0004	0.1317	-0.0026
11	0.0053	0.0004	0.1330	0.0055	71	0.0374	0.0004	0.1343	-0.0060
12	0.0058	0.0004	0.1318	0.0042	72	0.0380	0.0004	0.1400	-0.0116
13	0.0063	0.0004	0.1308	0.0087	73	0.0385	0.0003	0.1419	-0.0149
14	0.0068	0.0005	0.1306	0.0118	74	0.0391	0.0003	0.1377	-0.0127
15	0.0074	0.0005	0.1296	0.0104	75	0.0397	0.0002	0.1367	-0.0084
16	0.0079	0.0005	0.1309	0.0081	76	0.0402	0.0002	0.1367	-0.0072
17	0.0084	0.0006	0.1314	0.0050	77	0.0407	0.0002	0.1351	-0.0089
18	0.0089	0.0006	0.1313	0.0034	78	0.0413	0.0001	0.1325	-0.0147
19	0.0095	0.0006	0.1339	0.0038	79	0.0418	0.0000	0.1316	-0.0175
20	0.0100	0.0006	0.1334	0.0059	80	0.0423	0.0000	0.1360	-0.0137
21	0.0105	0.0006	0.1310	0.0032	81	0.0429	-0.0001	0.1364	-0.0100
22	0.0110	0.0006	0.1309	0.0013	82	0.0434	-0.0001	0.1335	-0.0096
23	0.0116	0.0006	0.1306	-0.0014	83	0.0440	-0.0001	0.1370	-0.0168
24	0.0121	0.0006	0.1315	-0.0001	84	0.0445	-0.0002	0.1405	-0.0159
25	0.0126	0.0006	0.1312	0.0010	85	0.0451	-0.0003	0.1393	-0.0104
26	0.0131	0.0006	0.1308	-0.0013	86	0.0456	-0.0003	0.1372	-0.0097
27	0.0137	0.0006	0.1311	0.0009	87	0.0462	-0.0003	0.1367	-0.0123
28	0.0142	0.0006	0.1303	0.0008	88	0.0467	-0.0004	0.1355	-0.0185
29	0.0147	0.0006	0.1316	-0.0012	89	0.0473	-0.0005	0.1310	-0.0188
30	0.0152	0.0006	0.1321	0.0000	90	0.0478	-0.0006	0.1319	-0.0134
31	0.0158	0.0006	0.1299	0.0018	91	0.0483	-0.0006	0.1341	-0.0125
32	0.0163	0.0006	0.1322	-0.0012	92	0.0489	-0.0007	0.1321	-0.0158
33	0.0168	0.0006	0.1328	-0.0011	93	0.0494	-0.0007	0.1309	-0.0185
34	0.0173	0.0006	0.1327	0.0019	94	0.0499	-0.0008	0.1322	-0.0164
35	0.0179	0.0006	0.1398	-0.0017	95	0.0504	-0.0009	0.1312	-0.0109
36	0.0185	0.0006	0.1406	-0.0028	96	0.0509	-0.0009	0.1313	-0.0078
37	0.0190	0.0006	0.1383	0.0000	97	0.0515	-0.0009	0.1330	-0.0138
38	0.0196	0.0006	0.1376	-0.0001	98	0.0520	-0.0010	0.1311	-0.0164
39	0.0201	0.0006	0.1369	-0.0009	99	0.0525	-0.0011	0.1300	-0.0120
40	0.0207	0.0006	0.1352	-0.0006	100	0.0531	-0.0011	0.1307	-0.0110
41	0.0212	0.0006	0.1326	-0.0012	101	0.0536	-0.0011	0.1319	-0.0104
42	0.0217	0.0006	0.1348	-0.0025	102	0.0541	-0.0012	0.1302	-0.0154
43	0.0223	0.0006	0.1344	-0.0009	103	0.0546	-0.0013	0.1296	-0.0155
44	0.0228	0.0006	0.1314	-0.0002	104	0.0551	-0.0013	0.1318	-0.0106
45	0.0233	0.0006	0.1330	0.0002	105	0.0557	-0.0013	0.1315	-0.0092
46	0.0239	0.0006	0.1322	-0.0015	106	0.0562	-0.0014	0.1310	-0.0085
47	0.0244	0.0006	0.1308	-0.0017	107	0.0567	-0.0014	0.1301	-0.0060
48	0.0249	0.0006	0.1344	0.0007	108	0.0572	-0.0014	0.1293	-0.0015
49	0.0255	0.0006	0.1393	-0.0016	109	0.0578	-0.0014	0.1348	-0.0042
50	0.0260	0.0006	0.1409	-0.0028	110	0.0583	-0.0015	0.1402	-0.0114
51	0.0266	0.0006	0.1385	-0.0025	111	0.0589	-0.0015	0.1411	-0.0146
52	0.0271	0.0005	0.1382	-0.0018	112	0.0594	-0.0016	0.1384	-0.0097
53	0.0277	0.0006	0.1371	-0.0013	113	0.0600	-0.0016	0.1376	-0.0066
54	0.0282	0.0005	0.1332	0.0004	114	0.0605	-0.0016	0.1346	-0.0064
55	0.0287	0.0006	0.1339	-0.0002	115	0.0611	-0.0016	0.1318	-0.0025
56	0.0293	0.0005	0.1359	-0.0038	116	0.0616	-0.0017	0.1350	-0.0034
57	0.0298	0.0005	0.1342	-0.0026	117	0.0621	-0.0017	0.1379	-0.0057
58	0.0304	0.0005	0.1349	-0.0015	118	0.0627	-0.0017	0.1347	-0.0111
59	0.0309	0.0005	0.1391	0.0002	119	0.0632	-0.0018	0.1320	-0.0126
60	0.0315	0.0005	0.1432	-0.0009	120	0.0638	-0.0018	0.1333	-0.0094

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
121	0.0643	-0.0018	0.1308	-0.0085	181	0.0966	-0.0046	0.1352	-0.0167
122	0.0648	-0.0019	0.1301	-0.0044	182	0.0971	-0.0047	0.1303	-0.0139
123	0.0653	-0.0019	0.1336	-0.0056	183	0.0976	-0.0048	0.1309	-0.0142
124	0.0659	-0.0019	0.1390	-0.0057	184	0.0981	-0.0048	0.1337	-0.0116
125	0.0664	-0.0019	0.1441	-0.0028	185	0.0987	-0.0048	0.1318	-0.0123
126	0.0670	-0.0019	0.1400	-0.0007	186	0.0992	-0.0049	0.1350	-0.0193
127	0.0676	-0.0019	0.1366	0.0003	187	0.0997	-0.0050	0.1313	-0.0144
128	0.0681	-0.0019	0.1369	-0.0032	188	0.1002	-0.0050	0.1295	-0.0075
129	0.0687	-0.0020	0.1326	-0.0033	189	0.1008	-0.0051	0.1336	-0.0064
130	0.0692	-0.0020	0.1332	-0.0079	190	0.1013	-0.0051	0.1354	-0.0059
131	0.0697	-0.0020	0.1339	-0.0138	191	0.1019	-0.0051	0.1321	-0.0133
132	0.0703	-0.0021	0.1335	-0.0122	192	0.1024	-0.0052	0.1269	-0.0124
133	0.0708	-0.0021	0.1339	-0.0082	193	0.1029	-0.0052	0.1276	-0.0086
134	0.0713	-0.0021	0.1323	-0.0065	194	0.1034	-0.0053	0.1328	-0.0085
135	0.0718	-0.0022	0.1320	-0.0060	195	0.1039	-0.0053	0.1336	-0.0049
136	0.0724	-0.0022	0.1324	-0.0053	196	0.1045	-0.0053	0.1300	-0.0062
137	0.0729	-0.0022	0.1300	-0.0040	197	0.1050	-0.0053	0.1301	-0.0044
138	0.0734	-0.0022	0.1335	-0.0023	198	0.1055	-0.0053	0.1348	-0.0050
139	0.0740	-0.0022	0.1414	-0.0105	199	0.1061	-0.0054	0.1422	-0.0132
140	0.0746	-0.0023	0.1430	-0.0158	200	0.1066	-0.0054	0.1441	-0.0137
141	0.0751	-0.0024	0.1381	-0.0118	201	0.1072	-0.0055	0.1353	-0.0095
142	0.0757	-0.0024	0.1351	-0.0082	202	0.1077	-0.0055	0.1316	-0.0062
143	0.0762	-0.0024	0.1372	-0.0079	203	0.1083	-0.0055	0.1329	-0.0016
144	0.0768	-0.0025	0.1379	-0.0069	204	0.1088	-0.0055	0.1343	-0.0058
145	0.0773	-0.0025	0.1354	-0.0054	205	0.1093	-0.0056	0.1379	-0.0051
146	0.0778	-0.0025	0.1344	-0.0128	206	0.1099	-0.0056	0.1333	-0.0025
147	0.0784	-0.0026	0.1321	-0.0173	207	0.1104	-0.0056	0.1296	-0.0046
148	0.0789	-0.0026	0.1311	-0.0123	208	0.1109	-0.0056	0.1346	-0.0053
149	0.0794	-0.0027	0.1327	-0.0107	209	0.1115	-0.0056	0.1359	-0.0106
150	0.0800	-0.0027	0.1333	-0.0134	210	0.1120	-0.0057	0.1339	-0.0120
151	0.0805	-0.0028	0.1399	-0.0143	211	0.1126	-0.0057	0.1330	-0.0103
152	0.0811	-0.0028	0.1420	-0.0151	212	0.1131	-0.0058	0.1300	-0.0091
153	0.0816	-0.0029	0.1383	-0.0141	213	0.1136	-0.0058	0.1302	-0.0080
154	0.0822	-0.0029	0.1352	-0.0109	214	0.1141	-0.0058	0.1319	-0.0081
155	0.0827	-0.0030	0.1331	-0.0090	215	0.1146	-0.0059	0.1318	-0.0066
156	0.0832	-0.0030	0.1340	-0.0121	216	0.1152	-0.0059	0.1369	-0.0129
157	0.0838	-0.0031	0.1354	-0.0227	217	0.1157	-0.0060	0.1428	-0.0159
158	0.0843	-0.0032	0.1339	-0.0197	218	0.1163	-0.0060	0.1413	-0.0124
159	0.0849	-0.0032	0.1327	-0.0093	219	0.1169	-0.0061	0.1377	-0.0102
160	0.0854	-0.0033	0.1324	-0.0144	220	0.1174	-0.0061	0.1348	-0.0092
161	0.0859	-0.0034	0.1302	-0.0170	221	0.1180	-0.0061	0.1357	-0.0145
162	0.0864	-0.0034	0.1318	-0.0161	222	0.1185	-0.0062	0.1379	-0.0158
163	0.0870	-0.0035	0.1307	-0.0143	223	0.1191	-0.0063	0.1340	-0.0122
164	0.0875	-0.0035	0.1312	-0.0166	224	0.1196	-0.0063	0.1318	-0.0113
165	0.0880	-0.0036	0.1327	-0.0201	225	0.1201	-0.0064	0.1311	-0.0080
166	0.0885	-0.0037	0.1292	-0.0165	226	0.1206	-0.0064	0.1333	-0.0071
167	0.0891	-0.0038	0.1309	-0.0177	227	0.1212	-0.0064	0.1420	-0.0131
168	0.0896	-0.0038	0.1318	-0.0164	228	0.1218	-0.0065	0.1427	-0.0165
169	0.0901	-0.0039	0.1298	-0.0162	229	0.1223	-0.0065	0.1380	-0.0137
170	0.0906	-0.0040	0.1300	-0.0156	230	0.1229	-0.0066	0.1341	-0.0095
171	0.0911	-0.0040	0.1322	-0.0116	231	0.1234	-0.0066	0.1328	-0.0078
172	0.0917	-0.0041	0.1327	-0.0168	232	0.1239	-0.0067	0.1352	-0.0075
173	0.0922	-0.0041	0.1301	-0.0193	233	0.1245	-0.0067	0.1378	-0.0125
174	0.0927	-0.0042	0.1319	-0.0160	234	0.1250	-0.0068	0.1350	-0.0151
175	0.0933	-0.0043	0.1356	-0.0165	235	0.1256	-0.0068	0.1325	-0.0161
176	0.0938	-0.0043	0.1390	-0.0167	236	0.1261	-0.0069	0.1336	-0.0173
177	0.0944	-0.0044	0.1399	-0.0159	237	0.1266	-0.0069	0.1309	-0.0156
178	0.0949	-0.0045	0.1381	-0.0139	238	0.1271	-0.0070	0.1307	-0.0168
179	0.0955	-0.0045	0.1361	-0.0132	239	0.1277	-0.0071	-	-
180	0.0960	-0.0046	0.1342	-0.0155					

Table B1.2 Raw data of free-falling PP-3.478-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0449	-0.0009	0.1753	-0.0104
2	0.0007	0.0000	0.1774	0.0102	66	0.0456	-0.0010	0.1741	-0.0122
3	0.0014	0.0001	0.1759	0.0042	67	0.0463	-0.0010	0.1778	-0.0115
4	0.0021	0.0001	0.1721	0.0018	68	0.0470	-0.0011	0.1759	-0.0076
5	0.0028	0.0001	0.1767	0.0026	69	0.0478	-0.0011	0.1760	-0.0067
6	0.0035	0.0001	0.1750	0.0007	70	0.0485	-0.0011	0.1753	-0.0059
7	0.0042	0.0001	0.1715	-0.0010	71	0.0492	-0.0011	0.1746	-0.0063
8	0.0049	0.0001	0.1763	-0.0014	72	0.0499	-0.0012	0.1742	-0.0061
9	0.0056	0.0001	0.1752	0.0003	73	0.0505	-0.0012	0.1741	-0.0030
10	0.0063	0.0001	0.1724	-0.0008	74	0.0512	-0.0012	0.1741	-0.0082
11	0.0070	0.0001	0.1770	-0.0012	75	0.0519	-0.0012	0.1742	-0.0111
12	0.0077	0.0001	0.1809	-0.0016	76	0.0526	-0.0013	0.1775	-0.0079
13	0.0084	0.0001	0.1782	-0.0025	77	0.0534	-0.0013	0.1812	-0.0074
14	0.0091	0.0001	0.1736	-0.0026	78	0.0541	-0.0013	0.1776	-0.0058
15	0.0098	0.0001	0.1765	-0.0026	79	0.0548	-0.0013	0.1731	-0.0061
16	0.0105	0.0000	0.1771	-0.0013	80	0.0555	-0.0014	0.1787	-0.0054
17	0.0112	0.0000	0.1751	-0.0027	81	0.0562	-0.0014	0.1772	-0.0032
18	0.0119	0.0000	0.1753	-0.0020	82	0.0569	-0.0014	0.1722	-0.0037
19	0.0126	0.0000	0.1715	-0.0011	83	0.0576	-0.0014	0.1781	-0.0031
20	0.0133	0.0000	0.1740	-0.0014	84	0.0583	-0.0014	0.1815	-0.0034
21	0.0140	0.0000	0.1775	-0.0037	85	0.0590	-0.0014	0.1779	-0.0077
22	0.0147	0.0000	0.1744	-0.0030	86	0.0597	-0.0015	0.1761	-0.0063
23	0.0154	0.0000	0.1747	-0.0008	87	0.0604	-0.0015	0.1769	-0.0074
24	0.0161	0.0000	0.1759	-0.0023	88	0.0612	-0.0015	0.1765	-0.0067
25	0.0168	0.0000	0.1786	-0.0019	89	0.0619	-0.0016	0.1750	-0.0012
26	0.0176	0.0000	0.1781	-0.0029	90	0.0626	-0.0016	0.1748	-0.0033
27	0.0183	-0.0001	0.1730	-0.0018	91	0.0633	-0.0016	0.1759	-0.0037
28	0.0189	0.0000	0.1777	-0.0009	92	0.0640	-0.0016	0.1756	-0.0009
29	0.0197	-0.0001	0.1777	-0.0005	93	0.0647	-0.0016	0.1800	-0.0016
30	0.0204	-0.0001	0.1721	0.0011	94	0.0654	-0.0016	0.1816	-0.0020
31	0.0211	-0.0001	0.1781	-0.0009	95	0.0661	-0.0016	0.1759	0.0012
32	0.0218	-0.0001	0.1830	-0.0022	96	0.0668	-0.0016	0.1762	-0.0003
33	0.0225	-0.0001	0.1761	0.0007	97	0.0675	-0.0016	0.1788	-0.0011
34	0.0232	-0.0001	0.1738	-0.0016	98	0.0682	-0.0016	0.1803	-0.0012
35	0.0239	-0.0001	0.1775	-0.0047	99	0.0690	-0.0016	0.1783	-0.0001
36	0.0246	-0.0001	0.1751	-0.0007	100	0.0697	-0.0016	0.1765	0.0009
37	0.0253	-0.0001	0.1746	-0.0011	101	0.0704	-0.0016	0.1790	-0.0015
38	0.0260	-0.0001	0.1751	-0.0028	102	0.0711	-0.0016	0.1826	0.0006
39	0.0267	-0.0001	0.1760	-0.0020	103	0.0718	-0.0016	0.1793	0.0005
40	0.0274	-0.0001	0.1755	-0.0002	104	0.0725	-0.0016	0.1768	-0.0018
41	0.0281	-0.0001	0.1739	-0.0025	105	0.0733	-0.0016	0.1793	0.0017
42	0.0288	-0.0001	0.1744	-0.0099	106	0.0740	-0.0016	0.1812	0.0019
43	0.0295	-0.0002	0.1744	-0.0123	107	0.0747	-0.0016	0.1791	-0.0032
44	0.0302	-0.0002	0.1731	-0.0107	108	0.0754	-0.0016	0.1760	-0.0010
45	0.0309	-0.0003	0.1720	-0.0098	109	0.0761	-0.0016	0.1781	-0.0009
46	0.0316	-0.0003	0.1749	-0.0061	110	0.0768	-0.0016	0.1732	-0.0007
47	0.0323	-0.0003	0.1758	-0.0061	111	0.0775	-0.0016	0.1756	0.0005
48	0.0330	-0.0004	0.1733	-0.0064	112	0.0782	-0.0016	0.1797	-0.0022
49	0.0337	-0.0004	0.1740	-0.0042	113	0.0789	-0.0016	0.1811	-0.0020
50	0.0344	-0.0004	0.1753	-0.0087	114	0.0797	-0.0016	0.1765	0.0008
51	0.0351	-0.0004	0.1738	-0.0135	115	0.0803	-0.0016	0.1747	0.0019
52	0.0358	-0.0005	0.1735	-0.0098	116	0.0811	-0.0016	0.1822	0.0012
53	0.0365	-0.0005	0.1743	-0.0067	117	0.0818	-0.0016	0.1839	0.0006
54	0.0372	-0.0006	0.1729	-0.0081	118	0.0825	-0.0016	0.1762	-0.0020
55	0.0379	-0.0006	0.1729	-0.0072	119	0.0832	-0.0016	0.1718	0.0024
56	0.0386	-0.0006	0.1764	-0.0062	120	0.0839	-0.0016	0.1776	0.0040
57	0.0393	-0.0006	0.1806	-0.0050	121	0.0846	-0.0016	0.1737	0.0013
58	0.0400	-0.0007	0.1780	-0.0105	122	0.0853	-0.0016	0.1732	0.0024
59	0.0407	-0.0007	0.1748	-0.0137	123	0.0860	-0.0016	0.1788	0.0017
60	0.0414	-0.0008	0.1783	-0.0104	124	0.0867	-0.0016	0.1768	0.0024
61	0.0421	-0.0008	0.1763	-0.0093	125	0.0874	-0.0016	0.1740	0.0031
62	0.0428	-0.0008	0.1722	-0.0078	126	0.0881	-0.0016	0.1732	0.0017
63	0.0435	-0.0009	0.1768	-0.0048	127	0.0888	-0.0015	0.1738	0.0021
64	0.0442	-0.0009	0.1815	-0.0062	128	0.0895	-0.0015	0.1745	0.0021

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0902	-0.0015	0.1739	0.0018	185	0.1291	0.0001	0.1740	0.0174
130	0.0909	-0.0015	0.1710	0.0049	186	0.1298	0.0001	0.1770	0.0157
131	0.0916	-0.0015	0.1740	0.0042	187	0.1306	0.0002	0.1731	0.0208
132	0.0923	-0.0015	0.1786	0.0025	188	0.1312	0.0003	0.1705	0.0233
133	0.0930	-0.0015	0.1776	0.0028	189	0.1319	0.0004	0.1744	0.0186
134	0.0937	-0.0015	0.1755	0.0017	190	0.1326	0.0004	0.1741	0.0233
135	0.0944	-0.0015	0.1728	0.0011	191	0.1333	0.0006	0.1720	0.0243
136	0.0951	-0.0015	0.1746	0.0025	192	0.1340	0.0006	0.1733	0.0200
137	0.0958	-0.0014	0.1763	0.0027	193	0.1347	0.0007	0.1721	0.0234
138	0.0965	-0.0014	0.1746	0.0088	194	0.1354	0.0008	0.1723	0.0254
139	0.0972	-0.0014	0.1764	0.0119	195	0.1361	0.0009	0.1727	0.0286
140	0.0979	-0.0013	0.1727	0.0079	196	0.1368	0.0011	0.1714	0.0318
141	0.0986	-0.0013	0.1693	0.0084	197	0.1374	0.0012	0.1721	0.0261
142	0.0993	-0.0013	0.1755	0.0071	198	0.1381	0.0013	0.1734	0.0267
143	0.1000	-0.0012	0.1734	0.0044	199	0.1388	0.0014	0.1709	0.0300
144	0.1007	-0.0012	0.1724	0.0035	200	0.1395	0.0015	0.1690	0.0287
145	0.1014	-0.0012	0.1777	0.0020	201	0.1402	0.0016	0.1671	0.0287
146	0.1021	-0.0012	0.1729	0.0016	202	0.1408	0.0017	0.1672	0.0300
147	0.1028	-0.0012	0.1697	0.0029	203	0.1415	0.0019	0.1670	0.0299
148	0.1035	-0.0012	0.1750	0.0011	204	0.1422	0.0020	0.1673	0.0312
149	0.1042	-0.0012	0.1725	-0.0016	205	0.1429	0.0021	0.1718	0.0321
150	0.1048	-0.0012	0.1723	-0.0013	206	0.1436	0.0022	0.1698	0.0321
151	0.1055	-0.0012	0.1804	0.0005	207	0.1442	0.0024	0.1653	0.0333
152	0.1063	-0.0012	0.1801	0.0052	208	0.1449	0.0025	0.1641	0.0322
153	0.1070	-0.0012	0.1679	0.0137	209	0.1455	0.0026	0.1675	0.0275
154	0.1076	-0.0011	0.1682	0.0147	210	0.1462	0.0027	0.1674	0.0239
155	0.1083	-0.0010	0.1753	0.0070	211	0.1469	0.0028	0.1655	0.0258
156	0.1090	-0.0010	0.1704	0.0067	212	0.1475	0.0029	0.1688	0.0246
157	0.1097	-0.0010	0.1709	0.0082	213	0.1482	0.0030	0.1688	0.0269
158	0.1104	-0.0010	0.1709	0.0043	214	0.1489	0.0031	0.1715	0.0258
159	0.1111	-0.0010	0.1716	0.0032	215	0.1496	0.0032	0.1693	0.0172
160	0.1118	-0.0009	0.1734	0.0035	216	0.1502	0.0033	0.1646	0.0226
161	0.1124	-0.0009	0.1708	0.0052	217	0.1509	0.0034	0.1679	0.0242
162	0.1131	-0.0009	0.1730	0.0092	218	0.1516	0.0035	0.1673	0.0166
163	0.1138	-0.0009	0.1729	0.0116	219	0.1522	0.0035	0.1692	0.0212
164	0.1145	-0.0008	0.1731	0.0115	220	0.1529	0.0036	0.1713	0.0217
165	0.1152	-0.0008	0.1763	0.0076	221	0.1536	0.0037	0.1710	0.0124
166	0.1159	-0.0008	0.1744	0.0065	222	0.1543	0.0037	0.1723	0.0111
167	0.1166	-0.0007	0.1722	0.0060	223	0.1550	0.0038	0.1694	0.0151
168	0.1173	-0.0007	0.1743	0.0049	224	0.1557	0.0039	0.1703	0.0149
169	0.1180	-0.0007	0.1770	0.0044	225	0.1564	0.0039	0.1698	0.0108
170	0.1187	-0.0007	0.1754	0.0026	226	0.1570	0.0039	0.1701	0.0082
171	0.1194	-0.0007	0.1685	0.0073	227	0.1577	0.0040	0.1741	0.0063
172	0.1201	-0.0006	0.1690	0.0144	228	0.1584	0.0040	0.1694	0.0037
173	0.1208	-0.0005	0.1789	0.0179	229	0.1591	0.0040	0.1683	0.0038
174	0.1215	-0.0005	0.1823	0.0120	230	0.1598	0.0040	0.1721	0.0018
175	0.1222	-0.0004	0.1733	0.0014	231	0.1604	0.0040	0.1706	-0.0004
176	0.1229	-0.0005	0.1695	0.0040	232	0.1611	0.0040	0.1709	0.0024
177	0.1236	-0.0004	0.1752	0.0079	233	0.1618	0.0040	0.1709	0.0020
178	0.1243	-0.0004	0.1736	0.0082	234	0.1625	0.0040	0.1681	0.0022
179	0.1250	-0.0003	0.1727	0.0139	235	0.1632	0.0041	0.1662	0.0075
180	0.1257	-0.0003	0.1761	0.0171	236	0.1638	0.0041	0.1677	0.0099
181	0.1264	-0.0002	0.1750	0.0137	237	0.1645	0.0041	0.1747	0.0093
182	0.1271	-0.0002	0.1709	0.0114	238	0.1652	0.0042	0.1741	0.0061
183	0.1277	-0.0001	0.1741	0.0199	239	0.1659	0.0042	-	-
184	0.1285	0.0000	0.1747	0.0219					

Table B1.3 Raw data of free-falling PMMA-1.984-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0178	-0.0003	0.0682	-0.0018
2	0.0003	0.0000	0.0685	0.0002	66	0.0181	-0.0003	0.0703	-0.0014
3	0.0005	0.0000	0.0686	-0.0016	67	0.0184	-0.0003	0.0681	-0.0008
4	0.0008	0.0000	0.0690	-0.0014	68	0.0186	-0.0003	0.0667	-0.0017
5	0.0011	0.0000	0.0684	-0.0002	69	0.0189	-0.0003	0.0708	-0.0014
6	0.0014	0.0000	0.0692	-0.0006	70	0.0192	-0.0004	0.0773	0.0001
7	0.0017	0.0000	0.0673	-0.0008	71	0.0195	-0.0003	0.0777	-0.0009
8	0.0019	0.0000	0.0659	-0.0007	72	0.0198	-0.0004	0.0716	-0.0007
9	0.0022	0.0000	0.0663	-0.0005	73	0.0201	-0.0003	0.0689	-0.0004
10	0.0025	0.0000	0.0678	0.0009	74	0.0204	-0.0004	0.0691	-0.0034
11	0.0027	0.0000	0.0670	0.0000	75	0.0207	-0.0004	0.0668	-0.0013
12	0.0030	0.0000	0.0686	-0.0019	76	0.0209	-0.0004	0.0657	0.0009
13	0.0033	0.0000	0.0726	-0.0016	77	0.0212	-0.0004	0.0681	0.0002
14	0.0036	0.0000	0.0747	-0.0001	78	0.0215	-0.0004	0.0680	0.0007
15	0.0039	0.0000	0.0725	-0.0004	79	0.0217	-0.0004	0.0679	0.0005
16	0.0041	0.0000	0.0717	-0.0002	80	0.0220	-0.0004	0.0670	0.0004
17	0.0044	0.0000	0.0700	-0.0012	81	0.0223	-0.0004	0.0671	0.0011
18	0.0047	0.0000	0.0689	-0.0016	82	0.0225	-0.0004	0.0679	0.0000
19	0.0050	0.0000	0.0706	0.0012	83	0.0228	-0.0004	0.0689	-0.0006
20	0.0053	0.0000	0.0698	-0.0013	84	0.0231	-0.0004	0.0734	0.0001
21	0.0056	-0.0001	0.0699	-0.0015	85	0.0234	-0.0004	0.0777	-0.0003
22	0.0058	0.0000	0.0682	0.0001	86	0.0237	-0.0004	0.0747	0.0004
23	0.0061	-0.0001	0.0669	-0.0006	87	0.0240	-0.0004	0.0714	-0.0003
24	0.0064	0.0000	0.0663	-0.0007	88	0.0243	-0.0004	0.0695	-0.0003
25	0.0066	-0.0001	0.0675	-0.0010	89	0.0246	-0.0004	0.0685	0.0000
26	0.0069	-0.0001	0.0677	-0.0003	90	0.0248	-0.0004	0.0685	0.0003
27	0.0072	-0.0001	0.0677	-0.0018	91	0.0251	-0.0004	0.0693	0.0010
28	0.0074	-0.0001	0.0711	-0.0013	92	0.0254	-0.0004	0.0691	-0.0012
29	0.0077	-0.0001	0.0756	0.0006	93	0.0257	-0.0004	0.0665	0.0003
30	0.0081	-0.0001	0.0752	0.0010	94	0.0259	-0.0004	0.0677	-0.0014
31	0.0083	-0.0001	0.0725	-0.0002	95	0.0262	-0.0004	0.0684	-0.0003
32	0.0086	-0.0001	0.0711	0.0003	96	0.0265	-0.0004	0.0682	-0.0005
33	0.0089	-0.0001	0.0684	-0.0018	97	0.0267	-0.0004	0.0719	-0.0014
34	0.0092	-0.0001	0.0669	-0.0022	98	0.0270	-0.0004	0.0771	0.0005
35	0.0094	-0.0001	0.0672	-0.0002	99	0.0274	-0.0004	0.0751	0.0030
36	0.0097	-0.0001	0.0689	-0.0002	100	0.0276	-0.0003	0.0713	0.0020
37	0.0100	-0.0001	0.0673	-0.0025	101	0.0279	-0.0004	0.0710	0.0008
38	0.0103	-0.0001	0.0691	-0.0012	102	0.0282	-0.0003	0.0711	0.0009
39	0.0105	-0.0001	0.0682	0.0022	103	0.0285	-0.0004	0.0700	-0.0012
40	0.0108	-0.0001	0.0659	-0.0007	104	0.0288	-0.0004	0.0683	-0.0001
41	0.0111	-0.0001	0.0671	-0.0018	105	0.0290	-0.0004	0.0683	-0.0002
42	0.0113	-0.0001	0.0670	0.0008	106	0.0293	-0.0004	0.0676	-0.0022
43	0.0116	-0.0001	0.0738	-0.0005	107	0.0296	-0.0004	0.0670	-0.0008
44	0.0119	-0.0001	0.0777	0.0001	108	0.0298	-0.0004	0.0651	0.0008
45	0.0122	-0.0001	0.0729	0.0014	109	0.0301	-0.0004	0.0661	-0.0014
46	0.0125	-0.0001	0.0713	-0.0003	110	0.0304	-0.0004	0.0673	0.0002
47	0.0128	-0.0001	0.0710	-0.0007	111	0.0306	-0.0004	0.0663	-0.0002
48	0.0131	-0.0001	0.0690	-0.0006	112	0.0309	-0.0004	0.0643	-0.0011
49	0.0134	-0.0001	0.0693	-0.0009	113	0.0312	-0.0004	0.0641	-0.0008
50	0.0136	-0.0001	0.0682	-0.0036	114	0.0314	-0.0004	0.0655	-0.0014
51	0.0139	-0.0001	0.0682	-0.0011	115	0.0317	-0.0004	0.0652	-0.0008
52	0.0142	-0.0001	0.0684	0.0013	116	0.0319	-0.0004	0.0650	-0.0007
53	0.0144	-0.0001	0.0659	-0.0014	117	0.0322	-0.0004	0.0660	0.0004
54	0.0147	-0.0001	0.0664	-0.0007	118	0.0325	-0.0004	0.0689	-0.0016
55	0.0150	-0.0001	0.0670	0.0017	119	0.0328	-0.0004	0.0746	-0.0092
56	0.0152	-0.0001	0.0678	-0.0021	120	0.0331	-0.0005	0.0774	-0.0123
57	0.0155	-0.0001	0.0738	-0.0084	121	0.0334	-0.0005	0.0746	-0.0074
58	0.0158	-0.0002	0.0763	-0.0110	122	0.0337	-0.0005	0.0726	-0.0055
59	0.0161	-0.0002	0.0735	-0.0093	123	0.0340	-0.0005	0.0719	-0.0034
60	0.0164	-0.0003	0.0711	-0.0052	124	0.0342	-0.0005	0.0700	-0.0004
61	0.0167	-0.0003	0.0701	-0.0040	125	0.0345	-0.0005	0.0698	-0.0021
62	0.0170	-0.0003	0.0707	-0.0050	126	0.0348	-0.0006	0.0672	-0.0021
63	0.0173	-0.0003	0.0707	-0.0045	127	0.0350	-0.0006	0.0651	-0.0024
64	0.0175	-0.0003	0.0693	-0.0013	128	0.0353	-0.0006	0.0691	-0.0006

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0356	-0.0006	0.0705	0.0005	185	0.0512	-0.0006	0.0676	-0.0017
130	0.0359	-0.0006	0.0728	-0.0015	186	0.0515	-0.0006	0.0744	-0.0037
131	0.0362	-0.0006	0.0773	-0.0017	187	0.0518	-0.0007	0.0770	-0.0091
132	0.0365	-0.0006	0.0752	-0.0018	188	0.0521	-0.0007	0.0759	-0.0099
133	0.0368	-0.0006	0.0718	-0.0007	189	0.0524	-0.0007	0.0714	-0.0072
134	0.0371	-0.0006	0.0706	-0.0003	190	0.0527	-0.0008	0.0698	-0.0062
135	0.0374	-0.0006	0.0704	0.0001	191	0.0530	-0.0008	0.0693	-0.0039
136	0.0376	-0.0006	0.0696	-0.0008	192	0.0533	-0.0008	0.0689	-0.0033
137	0.0379	-0.0006	0.0680	-0.0014	193	0.0536	-0.0008	0.0697	-0.0049
138	0.0382	-0.0006	0.0668	0.0014	194	0.0538	-0.0009	0.0693	-0.0029
139	0.0384	-0.0006	0.0685	0.0001	195	0.0541	-0.0008	0.0673	-0.0010
140	0.0387	-0.0006	0.0693	-0.0007	196	0.0544	-0.0009	0.0654	-0.0028
141	0.0390	-0.0006	0.0657	-0.0006	197	0.0546	-0.0009	0.0664	-0.0016
142	0.0393	-0.0006	0.0654	0.0001	198	0.0549	-0.0009	0.0678	0.0001
143	0.0395	-0.0006	0.0652	0.0011	199	0.0552	-0.0009	0.0667	-0.0009
144	0.0398	-0.0006	0.0646	-0.0015	200	0.0554	-0.0009	0.0666	-0.0014
145	0.0400	-0.0006	0.0677	-0.0010	201	0.0557	-0.0009	0.0727	-0.0009
146	0.0403	-0.0006	0.0755	-0.0014	202	0.0560	-0.0009	0.0752	-0.0015
147	0.0406	-0.0006	0.0777	-0.0023	203	0.0563	-0.0009	0.0749	-0.0015
148	0.0409	-0.0006	0.0737	-0.0008	204	0.0566	-0.0009	0.0741	-0.0006
149	0.0412	-0.0006	0.0697	-0.0007	205	0.0569	-0.0009	0.0688	0.0009
150	0.0415	-0.0006	0.0698	0.0007	206	0.0572	-0.0009	0.0682	0.0020
151	0.0418	-0.0006	0.0699	-0.0003	207	0.0574	-0.0009	0.0707	0.0015
152	0.0421	-0.0006	0.0690	0.0002	208	0.0577	-0.0009	0.0692	0.0016
153	0.0423	-0.0006	0.0680	-0.0002	209	0.0580	-0.0009	0.0666	-0.0016
154	0.0426	-0.0006	0.0673	-0.0019	210	0.0583	-0.0009	0.0669	-0.0021
155	0.0429	-0.0006	0.0671	0.0001	211	0.0585	-0.0009	0.0673	0.0009
156	0.0431	-0.0006	0.0674	-0.0002	212	0.0588	-0.0009	0.0674	-0.0003
157	0.0434	-0.0006	0.0689	0.0010	213	0.0591	-0.0009	0.0692	-0.0004
158	0.0437	-0.0006	0.0668	0.0019	214	0.0593	-0.0009	0.0737	-0.0001
159	0.0440	-0.0006	0.0671	-0.0015	215	0.0597	-0.0009	0.0760	-0.0003
160	0.0442	-0.0006	0.0734	-0.0012	216	0.0600	-0.0009	0.0745	-0.0014
161	0.0445	-0.0006	0.0779	0.0005	217	0.0603	-0.0009	0.0719	-0.0005
162	0.0449	-0.0006	0.0744	0.0004	218	0.0605	-0.0009	0.0703	-0.0007
163	0.0451	-0.0006	0.0721	0.0020	219	0.0608	-0.0009	0.0713	0.0003
164	0.0454	-0.0006	0.0709	-0.0002	220	0.0611	-0.0009	0.0708	0.0014
165	0.0457	-0.0006	0.0696	-0.0026	221	0.0614	-0.0009	0.0692	-0.0014
166	0.0460	-0.0006	0.0680	-0.0001	222	0.0617	-0.0009	0.0662	-0.0008
167	0.0462	-0.0006	0.0677	0.0014	223	0.0619	-0.0009	0.0669	0.0005
168	0.0465	-0.0006	0.0681	-0.0019	224	0.0622	-0.0009	0.0657	0.0007
169	0.0468	-0.0006	0.0677	-0.0017	225	0.0624	-0.0009	0.0658	0.0002
170	0.0471	-0.0006	0.0681	0.0011	226	0.0627	-0.0009	0.0674	0.0001
171	0.0473	-0.0006	0.0670	-0.0005	227	0.0630	-0.0009	0.0682	-0.0025
172	0.0476	-0.0006	0.0664	-0.0012	228	0.0633	-0.0009	0.0753	-0.0079
173	0.0479	-0.0006	0.0666	-0.0004	229	0.0636	-0.0010	0.0759	-0.0097
174	0.0481	-0.0006	0.0733	-0.0002	230	0.0639	-0.0010	0.0727	-0.0090
175	0.0485	-0.0006	0.0774	-0.0004	231	0.0642	-0.0010	0.0726	-0.0068
176	0.0488	-0.0006	0.0750	-0.0007	232	0.0645	-0.0011	0.0713	-0.0047
177	0.0491	-0.0007	0.0721	0.0007	233	0.0647	-0.0011	0.0690	-0.0027
178	0.0493	-0.0006	0.0701	0.0001	234	0.0650	-0.0011	0.0691	-0.0028
179	0.0496	-0.0006	0.0683	0.0011	235	0.0653	-0.0011	0.0690	-0.0031
180	0.0499	-0.0006	0.0696	0.0011	236	0.0656	-0.0011	0.0681	-0.0008
181	0.0502	-0.0006	0.0705	-0.0013	237	0.0658	-0.0011	0.0670	0.0004
182	0.0504	-0.0006	0.0674	0.0009	238	0.0661	-0.0011	0.0661	-0.0034
183	0.0507	-0.0006	0.0679	0.0010	239	0.0664	-0.0011	-	-
184	0.0510	-0.0006	0.0662	-0.0010					

Table B1.4 Raw data of free-falling PMMA-2.757-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0094	0.0006	0.0340	0.0046
2	0.0001	0.0000	0.0386	0.0009	66	0.0095	0.0006	0.0400	0.0017
3	0.0003	0.0000	0.0400	0.0011	67	0.0097	0.0006	0.0383	0.0018
4	0.0005	0.0000	0.0370	0.0008	68	0.0098	0.0006	0.0372	0.0024
5	0.0006	0.0000	0.0346	0.0001	69	0.0100	0.0006	0.0365	0.0009
6	0.0007	0.0000	0.0349	0.0008	70	0.0101	0.0007	0.0363	0.0067
7	0.0009	0.0000	0.0369	0.0018	71	0.0103	0.0007	0.0346	0.0109
8	0.0010	0.0000	0.0347	0.0000	72	0.0104	0.0007	0.0336	0.0082
9	0.0012	0.0000	0.0327	-0.0002	73	0.0106	0.0008	0.0341	0.0082
10	0.0013	0.0000	0.0343	0.0009	74	0.0107	0.0008	0.0345	0.0076
11	0.0014	0.0000	0.0407	0.0014	75	0.0108	0.0008	0.0392	0.0038
12	0.0016	0.0000	0.0388	0.0009	76	0.0110	0.0008	0.0369	0.0033
13	0.0017	0.0000	0.0358	0.0009	77	0.0111	0.0009	0.0377	0.0009
14	0.0019	0.0001	0.0369	0.0018	78	0.0113	0.0008	0.0372	0.0019
15	0.0020	0.0000	0.0368	-0.0004	79	0.0114	0.0009	0.0356	0.0044
16	0.0022	0.0000	0.0333	0.0004	80	0.0116	0.0009	0.0359	0.0041
17	0.0023	0.0001	0.0351	0.0014	81	0.0117	0.0009	0.0392	0.0024
18	0.0025	0.0001	0.0359	0.0006	82	0.0119	0.0009	0.0430	-0.0010
19	0.0026	0.0001	0.0339	0.0011	83	0.0121	0.0009	0.0397	0.0020
20	0.0027	0.0001	0.0403	0.0019	84	0.0122	0.0009	0.0390	0.0085
21	0.0029	0.0001	0.0385	0.0013	85	0.0124	0.0010	0.0372	0.0108
22	0.0031	0.0001	0.0356	0.0006	86	0.0125	0.0010	0.0366	0.0102
23	0.0032	0.0001	0.0350	0.0004	87	0.0127	0.0010	0.0413	0.0080
24	0.0033	0.0001	0.0358	0.0012	88	0.0128	0.0011	0.0410	0.0039
25	0.0035	0.0001	0.0365	0.0015	89	0.0130	0.0011	0.0376	0.0027
26	0.0036	0.0001	0.0371	0.0005	90	0.0131	0.0011	0.0345	0.0033
27	0.0038	0.0001	0.0403	0.0005	91	0.0133	0.0011	0.0346	0.0021
28	0.0039	0.0001	0.0380	0.0013	92	0.0134	0.0011	0.0344	0.0020
29	0.0041	0.0001	0.0369	0.0025	93	0.0135	0.0011	0.0339	0.0019
30	0.0042	0.0001	0.0353	0.0009	94	0.0137	0.0011	0.0331	0.0022
31	0.0044	0.0001	0.0347	-0.0002	95	0.0138	0.0011	0.0332	0.0036
32	0.0045	0.0001	0.0341	0.0019	96	0.0139	0.0012	0.0335	0.0017
33	0.0046	0.0001	0.0335	0.0002	97	0.0141	0.0012	0.0352	0.0008
34	0.0048	0.0001	0.0330	-0.0001	98	0.0142	0.0012	0.0402	0.0017
35	0.0049	0.0001	0.0323	-0.0002	99	0.0144	0.0012	0.0375	0.0015
36	0.0050	0.0001	0.0333	0.0004	100	0.0145	0.0012	0.0380	0.0010
37	0.0052	0.0001	0.0350	0.0016	101	0.0147	0.0012	0.0376	0.0014
38	0.0053	0.0001	0.0355	-0.0001	102	0.0148	0.0012	0.0365	0.0070
39	0.0055	0.0001	0.0358	0.0008	103	0.0150	0.0012	0.0360	0.0113
40	0.0056	0.0001	0.0427	0.0096	104	0.0151	0.0013	0.0348	0.0099
41	0.0058	0.0002	0.0402	0.0133	105	0.0153	0.0013	0.0403	0.0069
42	0.0059	0.0002	0.0378	0.0089	106	0.0154	0.0013	0.0390	0.0059
43	0.0061	0.0003	0.0392	0.0069	107	0.0156	0.0014	0.0368	0.0047
44	0.0062	0.0003	0.0372	0.0051	108	0.0157	0.0014	0.0360	0.0029
45	0.0064	0.0003	0.0416	0.0042	109	0.0159	0.0014	0.0359	0.0034
46	0.0066	0.0003	0.0413	0.0031	110	0.0160	0.0014	0.0366	0.0034
47	0.0067	0.0003	0.0400	0.0013	111	0.0162	0.0014	0.0349	0.0018
48	0.0069	0.0003	0.0376	0.0019	112	0.0163	0.0014	0.0328	0.0013
49	0.0070	0.0004	0.0358	0.0026	113	0.0164	0.0014	0.0344	0.0026
50	0.0072	0.0004	0.0422	0.0017	114	0.0166	0.0014	0.0412	0.0007
51	0.0074	0.0004	0.0388	0.0018	115	0.0168	0.0014	0.0379	0.0003
52	0.0075	0.0004	0.0374	0.0012	116	0.0169	0.0014	0.0369	0.0009
53	0.0077	0.0004	0.0377	0.0014	117	0.0170	0.0014	0.0376	0.0016
54	0.0078	0.0004	0.0359	0.0015	118	0.0172	0.0014	0.0357	0.0087
55	0.0080	0.0004	0.0337	0.0076	119	0.0173	0.0015	0.0344	0.0099
56	0.0081	0.0004	0.0339	0.0116	120	0.0175	0.0015	0.0354	0.0091
57	0.0082	0.0005	0.0407	0.0088	121	0.0176	0.0016	0.0406	0.0092
58	0.0084	0.0005	0.0387	0.0066	122	0.0178	0.0016	0.0380	0.0045
59	0.0085	0.0005	0.0379	0.0046	123	0.0179	0.0016	0.0380	0.0026
60	0.0087	0.0006	0.0367	0.0065	124	0.0181	0.0016	0.0378	0.0038
61	0.0088	0.0006	0.0352	0.0045	125	0.0182	0.0016	0.0351	0.0041
62	0.0090	0.0006	0.0340	0.0012	126	0.0184	0.0016	0.0343	0.0023
63	0.0091	0.0006	0.0343	0.0010	127	0.0185	0.0017	0.0357	0.0019
64	0.0093	0.0006	0.0343	0.0022	128	0.0187	0.0017	0.0347	0.0038

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0188	0.0017	0.0331	0.0033	185	0.0270	0.0027	0.0351	0.0015
130	0.0189	0.0017	0.0400	-0.0002	186	0.0271	0.0027	0.0338	0.0016
131	0.0191	0.0017	0.0397	0.0005	187	0.0272	0.0027	0.0349	0.0033
132	0.0192	0.0017	0.0379	0.0023	188	0.0274	0.0027	0.0360	0.0038
133	0.0194	0.0017	0.0351	0.0078	189	0.0275	0.0027	0.0421	0.0015
134	0.0195	0.0018	0.0350	0.0121	190	0.0277	0.0027	0.0384	0.0000
135	0.0197	0.0018	0.0359	0.0099	191	0.0278	0.0027	0.0365	0.0007
136	0.0198	0.0018	0.0344	0.0057	192	0.0280	0.0027	0.0365	0.0017
137	0.0200	0.0018	0.0336	0.0046	193	0.0281	0.0027	0.0354	0.0010
138	0.0201	0.0019	0.0350	0.0051	194	0.0283	0.0027	0.0363	0.0019
139	0.0202	0.0019	0.0402	0.0034	195	0.0284	0.0027	0.0352	0.0081
140	0.0204	0.0019	0.0361	0.0038	196	0.0286	0.0028	0.0325	0.0110
141	0.0205	0.0019	0.0371	0.0032	197	0.0287	0.0028	0.0344	0.0084
142	0.0207	0.0019	0.0381	0.0028	198	0.0288	0.0029	0.0401	0.0069
143	0.0208	0.0019	0.0359	0.0010	199	0.0290	0.0029	0.0379	0.0037
144	0.0210	0.0019	0.0343	0.0020	200	0.0291	0.0029	0.0373	0.0034
145	0.0211	0.0020	0.0346	0.0011	201	0.0293	0.0029	0.0374	0.0045
146	0.0213	0.0019	0.0360	0.0012	202	0.0294	0.0029	0.0374	0.0036
147	0.0214	0.0020	0.0349	0.0088	203	0.0296	0.0029	0.0353	0.0029
148	0.0215	0.0020	0.0389	0.0101	204	0.0297	0.0030	0.0354	0.0024
149	0.0217	0.0020	0.0385	0.0088	205	0.0299	0.0030	0.0402	0.0018
150	0.0218	0.0021	0.0369	0.0065	206	0.0300	0.0030	0.0383	0.0015
151	0.0220	0.0021	0.0341	0.0057	207	0.0302	0.0030	0.0375	0.0016
152	0.0221	0.0021	0.0344	0.0049	208	0.0303	0.0030	0.0350	0.0010
153	0.0223	0.0021	0.0362	0.0032	209	0.0305	0.0030	0.0361	0.0013
154	0.0224	0.0022	0.0357	0.0015	210	0.0306	0.0030	0.0367	0.0013
155	0.0226	0.0021	0.0348	0.0042	211	0.0308	0.0030	0.0342	0.0009
156	0.0227	0.0022	0.0342	0.0052	212	0.0309	0.0030	0.0343	0.0015
157	0.0228	0.0022	0.0406	0.0005	213	0.0310	0.0030	0.0349	0.0066
158	0.0230	0.0022	0.0391	0.0020	214	0.0312	0.0030	0.0401	0.0099
159	0.0231	0.0022	0.0370	0.0011	215	0.0313	0.0031	0.0375	0.0089
160	0.0233	0.0022	0.0382	0.0019	216	0.0315	0.0031	0.0382	0.0068
161	0.0234	0.0022	0.0382	0.0083	217	0.0317	0.0031	0.0386	0.0049
162	0.0236	0.0023	0.0346	0.0120	218	0.0318	0.0032	0.0369	0.0060
163	0.0237	0.0023	0.0342	0.0092	219	0.0319	0.0032	0.0346	0.0043
164	0.0239	0.0023	0.0405	0.0046	220	0.0321	0.0032	0.0347	0.0031
165	0.0240	0.0024	0.0382	0.0047	221	0.0322	0.0032	0.0421	0.0035
166	0.0242	0.0024	0.0369	0.0036	222	0.0324	0.0032	0.0392	0.0026
167	0.0243	0.0024	0.0358	0.0035	223	0.0325	0.0032	0.0381	0.0021
168	0.0245	0.0024	0.0347	0.0028	224	0.0327	0.0032	0.0361	0.0020
169	0.0246	0.0024	0.0345	0.0019	225	0.0328	0.0032	0.0334	0.0021
170	0.0247	0.0024	0.0347	0.0024	226	0.0330	0.0033	0.0329	0.0006
171	0.0249	0.0024	0.0342	0.0023	227	0.0331	0.0033	0.0343	0.0003
172	0.0250	0.0024	0.0347	0.0033	228	0.0332	0.0033	0.0352	0.0007
173	0.0252	0.0025	0.0397	0.0022	229	0.0334	0.0033	0.0351	0.0004
174	0.0253	0.0025	0.0384	0.0012	230	0.0335	0.0033	0.0402	0.0010
175	0.0255	0.0025	0.0381	-0.0001	231	0.0337	0.0033	0.0376	0.0070
176	0.0256	0.0025	0.0360	0.0024	232	0.0338	0.0033	0.0373	0.0114
177	0.0258	0.0025	0.0368	0.0079	233	0.0340	0.0034	0.0361	0.0098
178	0.0259	0.0025	0.0363	0.0107	234	0.0341	0.0034	0.0359	0.0058
179	0.0261	0.0026	0.0347	0.0079	235	0.0343	0.0034	0.0356	0.0055
180	0.0262	0.0026	0.0338	0.0057	236	0.0344	0.0034	0.0341	0.0047
181	0.0263	0.0026	0.0349	0.0065	237	0.0346	0.0034	0.0333	0.0029
182	0.0265	0.0026	0.0412	0.0054	238	0.0347	0.0035	0.0347	0.0039
183	0.0267	0.0027	0.0387	0.0040	239	0.0348	0.0035	-	-
184	0.0268	0.0027	0.0379	0.0020					

Table B1.5 Raw data of free-falling PMMA-3.553-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0114	-0.0008	0.0451	-0.0068
2	0.0002	0.0000	0.0456	-0.0010	66	0.0116	-0.0008	0.0428	-0.0046
3	0.0004	0.0000	0.0443	-0.0035	67	0.0118	-0.0008	0.0444	-0.0036
4	0.0005	0.0000	0.0410	-0.0034	68	0.0120	-0.0008	0.0467	-0.0033
5	0.0007	0.0000	0.0462	-0.0014	69	0.0121	-0.0008	0.0499	-0.0037
6	0.0009	0.0000	0.0451	-0.0005	70	0.0124	-0.0009	0.0486	-0.0034
7	0.0011	0.0000	0.0396	-0.0008	71	0.0125	-0.0009	0.0431	-0.0004
8	0.0012	0.0000	0.0446	-0.0017	72	0.0127	-0.0009	0.0485	0.0002
9	0.0014	-0.0001	0.0451	-0.0019	73	0.0129	-0.0009	0.0472	-0.0017
10	0.0016	-0.0001	0.0414	-0.0020	74	0.0131	-0.0009	0.0423	-0.0020
11	0.0017	-0.0001	0.0460	-0.0010	75	0.0132	-0.0009	0.0477	-0.0011
12	0.0019	-0.0001	0.0450	-0.0014	76	0.0135	-0.0009	0.0504	-0.0008
13	0.0021	-0.0001	0.0409	-0.0008	77	0.0137	-0.0009	0.0443	-0.0007
14	0.0023	-0.0001	0.0457	0.0011	78	0.0138	-0.0009	0.0448	-0.0010
15	0.0025	-0.0001	0.0433	-0.0015	79	0.0140	-0.0009	0.0483	-0.0018
16	0.0026	-0.0001	0.0401	-0.0036	80	0.0142	-0.0009	0.0438	-0.0008
17	0.0028	-0.0001	0.0461	-0.0008	81	0.0144	-0.0009	0.0444	-0.0002
18	0.0030	-0.0001	0.0453	-0.0001	82	0.0146	-0.0009	0.0464	-0.0005
19	0.0032	-0.0001	0.0413	-0.0025	83	0.0147	-0.0009	0.0420	-0.0006
20	0.0033	-0.0001	0.0461	-0.0012	84	0.0149	-0.0009	0.0430	-0.0014
21	0.0035	-0.0001	0.0452	-0.0007	85	0.0151	-0.0009	0.0463	-0.0005
22	0.0037	-0.0001	0.0407	0.0011	86	0.0153	-0.0009	0.0435	-0.0001
23	0.0038	-0.0001	0.0450	-0.0003	87	0.0154	-0.0009	0.0435	-0.0004
24	0.0040	-0.0001	0.0430	-0.0033	88	0.0156	-0.0009	0.0459	-0.0007
25	0.0042	-0.0001	0.0416	-0.0005	89	0.0158	-0.0009	0.0492	-0.0062
26	0.0044	-0.0001	0.0485	0.0012	90	0.0160	-0.0010	0.0476	-0.0111
27	0.0046	-0.0001	0.0492	-0.0021	91	0.0162	-0.0010	0.0445	-0.0081
28	0.0048	-0.0001	0.0443	-0.0078	92	0.0164	-0.0010	0.0477	-0.0047
29	0.0049	-0.0002	0.0453	-0.0095	93	0.0166	-0.0010	0.0454	-0.0038
30	0.0051	-0.0002	0.0482	-0.0085	94	0.0167	-0.0011	0.0440	-0.0030
31	0.0053	-0.0002	0.0436	-0.0070	95	0.0169	-0.0011	0.0481	-0.0028
32	0.0055	-0.0003	0.0428	-0.0054	96	0.0171	-0.0011	0.0496	-0.0028
33	0.0057	-0.0003	0.0456	-0.0037	97	0.0173	-0.0011	0.0452	-0.0020
34	0.0058	-0.0003	0.0437	-0.0048	98	0.0175	-0.0011	0.0444	-0.0011
35	0.0060	-0.0003	0.0445	-0.0034	99	0.0177	-0.0011	0.0486	-0.0023
36	0.0062	-0.0003	0.0457	-0.0014	100	0.0179	-0.0011	0.0428	-0.0022
37	0.0064	-0.0003	0.0433	-0.0033	101	0.0180	-0.0011	0.0426	-0.0009
38	0.0065	-0.0004	0.0439	-0.0022	102	0.0182	-0.0011	0.0477	-0.0007
39	0.0067	-0.0004	0.0461	-0.0013	103	0.0184	-0.0011	0.0436	-0.0012
40	0.0069	-0.0004	0.0424	-0.0016	104	0.0185	-0.0011	0.0431	-0.0014
41	0.0071	-0.0004	0.0430	-0.0017	105	0.0187	-0.0011	0.0460	-0.0004
42	0.0073	-0.0004	0.0467	-0.0026	106	0.0189	-0.0011	0.0443	0.0004
43	0.0074	-0.0004	0.0485	-0.0072	107	0.0191	-0.0011	0.0449	-0.0004
44	0.0076	-0.0004	0.0461	-0.0115	108	0.0193	-0.0011	0.0462	0.0003
45	0.0078	-0.0005	0.0437	-0.0092	109	0.0195	-0.0011	0.0489	0.0012
46	0.0080	-0.0005	0.0481	-0.0061	110	0.0197	-0.0011	0.0471	-0.0002
47	0.0082	-0.0005	0.0457	-0.0061	111	0.0198	-0.0011	0.0439	-0.0002
48	0.0084	-0.0006	0.0425	-0.0047	112	0.0200	-0.0011	0.0490	-0.0015
49	0.0085	-0.0006	0.0462	-0.0028	113	0.0202	-0.0011	0.0523	-0.0008
50	0.0087	-0.0006	0.0445	-0.0020	114	0.0204	-0.0011	0.0464	0.0024
51	0.0089	-0.0006	0.0423	-0.0040	115	0.0206	-0.0011	0.0448	0.0001
52	0.0091	-0.0006	0.0466	-0.0022	116	0.0208	-0.0011	0.0493	-0.0005
53	0.0093	-0.0006	0.0504	-0.0012	117	0.0210	-0.0011	0.0448	0.0000
54	0.0095	-0.0006	0.0466	-0.0017	118	0.0211	-0.0011	0.0444	-0.0010
55	0.0096	-0.0006	0.0444	-0.0005	119	0.0213	-0.0011	0.0473	-0.0006
56	0.0098	-0.0006	0.0466	-0.0016	120	0.0215	-0.0011	0.0483	0.0000
57	0.0100	-0.0006	0.0432	-0.0017	121	0.0217	-0.0011	0.0475	0.0013
58	0.0102	-0.0006	0.0455	0.0004	122	0.0219	-0.0011	0.0440	0.0009
59	0.0104	-0.0006	0.0481	-0.0010	123	0.0221	-0.0011	0.0457	-0.0009
60	0.0106	-0.0006	0.0421	-0.0028	124	0.0223	-0.0011	0.0456	-0.0018
61	0.0107	-0.0007	0.0431	-0.0009	125	0.0224	-0.0011	0.0435	0.0005
62	0.0109	-0.0007	0.0459	-0.0077	126	0.0226	-0.0011	0.0466	0.0016
63	0.0111	-0.0007	0.0421	-0.0106	127	0.0228	-0.0011	0.0453	-0.0010
64	0.0112	-0.0007	0.0429	-0.0072	128	0.0230	-0.0011	0.0426	-0.0004

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0232	-0.0011	0.0459	0.0015	185	0.0334	-0.0011	0.0436	0.0003
130	0.0233	-0.0011	0.0441	-0.0006	186	0.0336	-0.0011	0.0466	0.0017
131	0.0235	-0.0011	0.0410	-0.0018	187	0.0338	-0.0011	0.0467	0.0011
132	0.0237	-0.0011	0.0464	0.0003	188	0.0339	-0.0011	0.0439	0.0002
133	0.0239	-0.0011	0.0503	-0.0004	189	0.0341	-0.0011	0.0470	0.0007
134	0.0241	-0.0011	0.0465	0.0002	190	0.0343	-0.0011	0.0446	-0.0006
135	0.0243	-0.0011	0.0454	0.0011	191	0.0345	-0.0011	0.0428	0.0004
136	0.0244	-0.0011	0.0460	-0.0003	192	0.0346	-0.0011	0.0470	0.0009
137	0.0246	-0.0011	0.0431	-0.0008	193	0.0348	-0.0010	0.0495	0.0008
138	0.0248	-0.0011	0.0454	-0.0008	194	0.0350	-0.0010	0.0468	0.0008
139	0.0250	-0.0011	0.0474	0.0018	195	0.0352	-0.0010	0.0439	0.0017
140	0.0252	-0.0011	0.0436	0.0005	196	0.0354	-0.0010	0.0462	0.0002
141	0.0253	-0.0011	0.0448	-0.0004	197	0.0356	-0.0010	0.0447	-0.0011
142	0.0255	-0.0011	0.0462	0.0013	198	0.0358	-0.0010	0.0436	0.0006
143	0.0257	-0.0011	0.0487	0.0008	199	0.0359	-0.0010	0.0469	0.0000
144	0.0259	-0.0011	0.0477	-0.0009	200	0.0361	-0.0010	0.0449	0.0007
145	0.0261	-0.0011	0.0438	0.0003	201	0.0363	-0.0010	0.0430	0.0011
146	0.0263	-0.0011	0.0480	0.0023	202	0.0365	-0.0010	0.0459	0.0008
147	0.0265	-0.0011	0.0468	0.0002	203	0.0367	-0.0010	0.0493	0.0002
148	0.0266	-0.0011	0.0424	-0.0013	204	0.0369	-0.0010	0.0480	0.0004
149	0.0268	-0.0011	0.0458	0.0009	205	0.0370	-0.0010	0.0432	0.0000
150	0.0270	-0.0011	0.0510	0.0003	206	0.0372	-0.0010	0.0462	0.0002
151	0.0272	-0.0011	0.0469	-0.0015	207	0.0374	-0.0010	0.0467	-0.0004
152	0.0274	-0.0011	0.0441	0.0005	208	0.0376	-0.0010	0.0438	-0.0003
153	0.0276	-0.0011	0.0478	0.0011	209	0.0378	-0.0010	0.0462	0.0020
154	0.0278	-0.0011	0.0444	0.0009	210	0.0380	-0.0010	0.0436	-0.0001
155	0.0279	-0.0011	0.0431	-0.0004	211	0.0381	-0.0010	0.0419	-0.0011
156	0.0281	-0.0011	0.0453	0.0003	212	0.0383	-0.0010	0.0464	-0.0002
157	0.0283	-0.0011	0.0427	0.0008	213	0.0385	-0.0010	0.0498	0.0023
158	0.0284	-0.0011	0.0440	0.0000	214	0.0387	-0.0010	0.0471	0.0009
159	0.0286	-0.0011	0.0460	0.0009	215	0.0389	-0.0010	0.0466	-0.0015
160	0.0288	-0.0011	0.0432	0.0002	216	0.0391	-0.0010	0.0487	0.0012
161	0.0290	-0.0011	0.0444	0.0001	217	0.0392	-0.0010	0.0428	0.0005
162	0.0292	-0.0011	0.0464	0.0015	218	0.0394	-0.0010	0.0428	0.0008
163	0.0294	-0.0011	0.0489	0.0013	219	0.0396	-0.0010	0.0473	0.0009
164	0.0296	-0.0011	0.0479	-0.0001	220	0.0398	-0.0010	0.0453	-0.0009
165	0.0297	-0.0011	0.0430	-0.0008	221	0.0400	-0.0010	0.0446	0.0006
166	0.0299	-0.0011	0.0468	0.0003	222	0.0401	-0.0010	0.0463	0.0012
167	0.0301	-0.0011	0.0464	0.0013	223	0.0403	-0.0010	0.0482	0.0007
168	0.0303	-0.0011	0.0437	0.0011	224	0.0405	-0.0010	0.0457	-0.0001
169	0.0305	-0.0011	0.0463	0.0000	225	0.0407	-0.0010	0.0431	-0.0010
170	0.0306	-0.0011	0.0436	0.0007	226	0.0409	-0.0010	0.0488	0.0015
171	0.0308	-0.0011	0.0420	0.0009	227	0.0411	-0.0010	0.0477	0.0005
172	0.0310	-0.0011	0.0456	-0.0001	228	0.0413	-0.0010	0.0437	-0.0018
173	0.0312	-0.0011	0.0491	-0.0008	229	0.0414	-0.0010	0.0465	-0.0003
174	0.0314	-0.0011	0.0477	-0.0001	230	0.0416	-0.0010	0.0492	0.0004
175	0.0316	-0.0011	0.0471	0.0012	231	0.0418	-0.0010	0.0469	0.0006
176	0.0318	-0.0011	0.0476	0.0007	232	0.0420	-0.0010	0.0456	-0.0001
177	0.0319	-0.0011	0.0422	-0.0012	233	0.0422	-0.0010	0.0474	0.0017
178	0.0321	-0.0011	0.0425	0.0002	234	0.0424	-0.0010	0.0449	0.0010
179	0.0323	-0.0011	0.0466	0.0024	235	0.0425	-0.0010	0.0448	-0.0004
180	0.0325	-0.0011	0.0449	0.0000	236	0.0427	-0.0010	0.0475	-0.0008
181	0.0326	-0.0011	0.0446	0.0010	237	0.0429	-0.0010	0.0497	0.0006
182	0.0328	-0.0011	0.0459	0.0010	238	0.0431	-0.0010	0.0468	0.0009
183	0.0330	-0.0011	0.0480	-0.0011	239	0.0433	-0.0010	-	-
184	0.0332	-0.0011	0.0474	-0.0001					

Appendix B2. Raw data of free-rising spheres in FW

Table B2.1 Raw data of free-rising PP-2.031-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	61	0.0130	0.0000	0.0498	0.0025
2	0.0002	0.0000	0.0527	0.0012	62	0.0132	0.0000	0.0675	0.0033
3	0.0004	0.0000	0.0579	-0.0006	63	0.0136	0.0000	0.0590	-0.0031
4	0.0006	0.0000	0.0578	-0.0030	64	0.0137	0.0000	0.0452	-0.0016
5	0.0009	0.0000	0.0579	0.0028	65	0.0139	0.0000	0.0514	0.0012
6	0.0011	0.0000	0.0605	0.0003	66	0.0141	0.0000	0.0642	-0.0019
7	0.0014	0.0000	0.0566	-0.0064	67	0.0144	0.0000	0.0525	-0.0007
8	0.0015	0.0000	0.0569	0.0001	68	0.0145	0.0000	0.0395	-0.0008
9	0.0018	0.0000	0.0576	0.0067	69	0.0148	0.0000	0.0648	0.0020
10	0.0020	0.0000	0.0481	-0.0020	70	0.0151	0.0000	0.0595	0.0032
11	0.0022	0.0000	0.0464	-0.0045	71	0.0152	0.0000	0.0367	-0.0020
12	0.0024	0.0000	0.0573	0.0018	72	0.0154	0.0000	0.0446	0.0000
13	0.0027	0.0000	0.0675	0.0038	73	0.0156	0.0000	0.0601	0.0003
14	0.0029	0.0000	0.0521	-0.0036	74	0.0158	0.0000	0.0608	-0.0038
15	0.0031	0.0000	0.0468	-0.0037	75	0.0161	0.0000	0.0431	-0.0010
16	0.0033	0.0000	0.0640	0.0052	76	0.0162	0.0000	0.0420	-0.0001
17	0.0036	0.0000	0.0669	0.0028	77	0.0164	0.0000	0.0629	0.0027
18	0.0038	0.0000	0.0479	-0.0008	78	0.0167	0.0000	0.0570	0.0045
19	0.0040	0.0000	0.0468	-0.0052	79	0.0169	0.0000	0.0417	-0.0038
20	0.0042	0.0000	0.0559	0.0003	80	0.0170	0.0000	0.0438	-0.0004
21	0.0044	0.0000	0.0585	-0.0008	81	0.0172	0.0000	0.0582	0.0047
22	0.0047	0.0000	0.0435	-0.0026	82	0.0175	0.0000	0.0594	-0.0037
23	0.0048	0.0000	0.0468	0.0030	83	0.0177	0.0000	0.0396	-0.0030
24	0.0050	0.0000	0.0640	0.0027	84	0.0178	0.0000	0.0459	0.0042
25	0.0053	0.0000	0.0490	-0.0007	85	0.0181	0.0000	0.0616	0.0035
26	0.0054	0.0000	0.0449	-0.0061	86	0.0183	0.0000	0.0513	-0.0046
27	0.0056	-0.0001	0.0491	-0.0006	87	0.0185	0.0000	0.0456	-0.0032
28	0.0058	0.0000	0.0602	0.0034	88	0.0187	0.0000	0.0524	0.0023
29	0.0061	0.0000	0.0608	0.0020	89	0.0189	0.0000	0.0621	-0.0011
30	0.0063	0.0000	0.0480	-0.0003	90	0.0192	0.0000	0.0485	0.0036
31	0.0065	0.0000	0.0627	0.0013	91	0.0193	0.0000	0.0371	-0.0007
32	0.0068	0.0000	0.0701	0.0007	92	0.0195	0.0000	0.0566	-0.0018
33	0.0071	0.0000	0.0489	-0.0051	93	0.0197	0.0000	0.0594	0.0038
34	0.0072	0.0000	0.0453	0.0002	94	0.0199	0.0000	0.0451	0.0002
35	0.0074	0.0000	0.0568	0.0018	95	0.0201	0.0000	0.0465	-0.0005
36	0.0077	0.0000	0.0603	-0.0048	96	0.0203	0.0000	0.0540	0.0011
37	0.0079	-0.0001	0.0442	0.0014	97	0.0205	0.0000	0.0563	0.0000
38	0.0080	0.0000	0.0426	0.0047	98	0.0208	0.0000	0.0475	-0.0014
39	0.0083	0.0000	0.0670	0.0015	99	0.0209	0.0000	0.0507	-0.0006
40	0.0086	0.0000	0.0633	0.0013	100	0.0212	0.0000	0.0652	0.0021
41	0.0088	0.0000	0.0493	-0.0022	101	0.0214	0.0000	0.0587	-0.0005
42	0.0089	0.0000	0.0495	0.0014	102	0.0216	0.0000	0.0452	0.0002
43	0.0092	0.0000	0.0708	-0.0020	103	0.0218	0.0000	0.0548	0.0022
44	0.0095	0.0000	0.0638	-0.0044	104	0.0221	0.0000	0.0630	0.0040
45	0.0097	0.0000	0.0380	-0.0014	105	0.0223	0.0000	0.0578	-0.0038
46	0.0098	0.0000	0.0456	0.0005	106	0.0225	0.0000	0.0459	-0.0059
47	0.0100	0.0000	0.0631	0.0061	107	0.0227	0.0000	0.0451	0.0041
48	0.0103	0.0000	0.0572	-0.0014	108	0.0229	0.0000	0.0618	0.0013
49	0.0105	0.0000	0.0463	-0.0036	109	0.0232	0.0000	0.0573	-0.0027
50	0.0107	0.0000	0.0529	-0.0022	110	0.0233	0.0000	0.0444	0.0000
51	0.0109	-0.0001	0.0612	-0.0027	111	0.0235	0.0000	0.0529	0.0014
52	0.0112	0.0000	0.0483	0.0035	112	0.0238	0.0000	0.0564	0.0020
53	0.0113	0.0000	0.0425	-0.0007	113	0.0240	0.0000	0.0471	-0.0015
54	0.0115	-0.0001	0.0675	0.0037	114	0.0242	0.0000	0.0438	-0.0055
55	0.0118	0.0000	0.0553	0.0056	115	0.0243	0.0000	0.0580	0.0025
56	0.0120	0.0000	0.0320	-0.0094	116	0.0246	0.0000	0.0584	0.0044
57	0.0121	-0.0001	0.0479	-0.0026	117	0.0248	0.0000	0.0474	-0.0024
58	0.0123	0.0000	0.0631	0.0058	118	0.0250	0.0000	0.0462	-0.0012
59	0.0126	0.0000	0.0621	0.0020	119	0.0251	0.0000	0.0435	0.0019
60	0.0128	0.0000	0.0526	-0.0005	120	0.0253	0.0000	0.0557	0.0004

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
121	0.0256	0.0000	0.0545	-0.0022	187	0.0391	-0.0001	0.0440	-0.0077
122	0.0258	0.0000	0.0465	-0.0041	188	0.0393	-0.0002	0.0465	-0.0054
123	0.0260	0.0000	0.0499	0.0026	189	0.0395	-0.0001	0.0617	0.0024
124	0.0262	0.0000	0.0615	0.0026	190	0.0398	-0.0001	0.0563	-0.0050
125	0.0265	0.0000	0.0512	-0.0043	191	0.0399	-0.0002	0.0453	-0.0037
126	0.0266	0.0000	0.0397	-0.0014	192	0.0401	-0.0002	0.0606	0.0050
127	0.0268	0.0000	0.0507	0.0015	193	0.0404	-0.0001	0.0649	0.0057
128	0.0270	0.0000	0.0535	0.0044	194	0.0406	-0.0001	0.0541	0.0021
129	0.0272	0.0000	0.0552	-0.0014	195	0.0409	-0.0001	0.0520	-0.0117
130	0.0274	0.0000	0.0451	-0.0027	196	0.0411	-0.0002	0.0580	-0.0150
131	0.0276	0.0000	0.0548	0.0048	197	0.0413	-0.0002	0.0576	-0.0172
132	0.0279	0.0000	0.0561	-0.0005	198	0.0415	-0.0004	0.0571	-0.0149
133	0.0280	0.0000	0.0399	-0.0067	199	0.0418	-0.0004	0.0598	-0.0117
134	0.0282	0.0000	0.0404	-0.0004	200	0.0420	-0.0004	0.0582	-0.0036
135	0.0283	0.0000	0.0488	0.0022	201	0.0422	-0.0004	0.0616	-0.0060
136	0.0286	0.0000	0.0508	0.0003	202	0.0425	-0.0005	0.0559	-0.0098
137	0.0287	0.0000	0.0559	-0.0004	203	0.0427	-0.0005	0.0570	0.0041
138	0.0290	0.0000	0.0525	-0.0061	204	0.0430	-0.0005	0.0642	-0.0009
139	0.0292	-0.0001	0.0455	-0.0030	205	0.0432	-0.0005	0.0601	-0.0109
140	0.0294	-0.0001	0.0610	0.0021	206	0.0434	-0.0005	0.0631	-0.0034
141	0.0296	0.0000	0.0561	0.0020	207	0.0437	-0.0005	0.0609	0.0064
142	0.0298	0.0000	0.0400	-0.0037	208	0.0439	-0.0005	0.0529	-0.0122
143	0.0300	-0.0001	0.0451	-0.0035	209	0.0441	-0.0006	0.0595	0.0018
144	0.0302	-0.0001	0.0578	0.0017	210	0.0444	-0.0005	0.0602	0.0206
145	0.0304	-0.0001	0.0524	0.0003	211	0.0446	-0.0004	0.0551	-0.0019
146	0.0306	-0.0001	0.0434	0.0005	212	0.0448	-0.0005	0.0619	-0.0017
147	0.0308	-0.0001	0.0512	-0.0003	213	0.0451	-0.0005	0.0672	0.0062
148	0.0310	-0.0001	0.0590	-0.0048	214	0.0454	-0.0004	0.0606	-0.0167
149	0.0312	-0.0001	0.0555	-0.0003	215	0.0456	-0.0006	0.0508	-0.0036
150	0.0315	-0.0001	0.0446	-0.0051	216	0.0458	-0.0005	0.0607	0.0205
151	0.0316	-0.0001	0.0386	-0.0022	217	0.0461	-0.0004	0.0577	0.0014
152	0.0318	-0.0001	0.0517	0.0045	218	0.0462	-0.0005	0.0544	-0.0048
153	0.0320	-0.0001	0.0624	-0.0040	219	0.0465	-0.0005	0.0574	0.0040
154	0.0323	-0.0001	0.0543	-0.0044	220	0.0467	-0.0004	0.0640	0.0029
155	0.0325	-0.0001	0.0388	0.0027	221	0.0470	-0.0004	0.0729	-0.0087
156	0.0326	-0.0001	0.0529	0.0033	222	0.0473	-0.0005	0.0618	-0.0021
157	0.0329	-0.0001	0.0608	-0.0095	223	0.0475	-0.0005	0.0662	-0.0075
158	0.0331	-0.0002	0.0459	-0.0009	224	0.0478	-0.0006	0.0623	-0.0045
159	0.0332	-0.0001	0.0465	0.0009	225	0.0480	-0.0005	0.0547	0.0185
160	0.0335	-0.0002	0.0461	-0.0019	226	0.0483	-0.0004	0.0691	-0.0083
161	0.0336	-0.0001	0.0502	0.0051	227	0.0486	-0.0006	0.0673	-0.0101
162	0.0339	-0.0001	0.0607	0.0047	228	0.0488	-0.0005	0.0491	0.0129
163	0.0341	-0.0001	0.0503	-0.0024	229	0.0490	-0.0005	0.0513	-0.0180
164	0.0343	-0.0001	0.0498	-0.0023	230	0.0492	-0.0006	0.0691	-0.0292
165	0.0345	-0.0001	0.0612	0.0029	231	0.0495	-0.0007	0.0660	-0.0164
166	0.0347	-0.0001	0.0473	0.0060	232	0.0497	-0.0008	0.0601	-0.0130
167	0.0349	-0.0001	0.0439	0.0001	233	0.0500	-0.0008	0.0625	-0.0151
168	0.0351	-0.0001	0.0508	0.0004	234	0.0502	-0.0009	0.0605	-0.0127
169	0.0353	-0.0001	0.0551	0.0017	235	0.0505	-0.0009	0.0531	-0.0124
170	0.0355	-0.0001	0.0520	-0.0057	236	0.0507	-0.0010	0.0510	-0.0109
171	0.0357	-0.0001	0.0444	-0.0048	237	0.0509	-0.0010	0.0612	0.0068
172	0.0359	-0.0001	0.0557	0.0070	238	0.0511	-0.0009	0.0599	0.0000
173	0.0361	-0.0001	0.0645	0.0042	239	0.0514	-0.0010	0.0536	-0.0106
174	0.0364	-0.0001	0.0534	0.0025	240	0.0516	-0.0010	0.0609	-0.0111
175	0.0366	0.0000	0.0420	0.0046	241	0.0519	-0.0011	0.0586	-0.0134
176	0.0367	-0.0001	0.0439	-0.0067	242	0.0520	-0.0011	0.0489	-0.0161
177	0.0369	-0.0001	0.0537	-0.0049	243	0.0522	-0.0012	0.0563	-0.0052
178	0.0372	-0.0001	0.0569	-0.0017	244	0.0525	-0.0012	0.0592	-0.0003
179	0.0374	-0.0001	0.0441	0.0016	245	0.0527	-0.0012	0.0620	-0.0104
180	0.0375	-0.0001	0.0501	0.0009	246	0.0530	-0.0013	0.0619	-0.0081
181	0.0378	-0.0001	0.0645	0.0010	247	0.0532	-0.0013	0.0598	-0.0035
182	0.0380	-0.0001	0.0503	0.0010	248	0.0535	-0.0013	0.0550	-0.0105
183	0.0382	-0.0001	0.0420	-0.0066	249	0.0537	-0.0014	0.0471	-0.0081
184	0.0384	-0.0001	0.0472	-0.0025	250	0.0538	-0.0013	0.0543	-0.0063
185	0.0386	-0.0001	0.0680	0.0063	251	0.0541	-0.0014	0.0636	-0.0057
186	0.0389	-0.0001	0.0693	0.0000	252	0.0544	-0.0014	0.0613	-0.0016

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
253	0.0546	-0.0014	0.0549	-0.0158	302	0.0647	-0.0045	0.0584	-0.0027
254	0.0548	-0.0015	0.0585	-0.0282	303	0.0649	-0.0045	0.0604	-0.0073
255	0.0550	-0.0016	0.0548	-0.0231	304	0.0651	-0.0045	0.0539	-0.0069
256	0.0552	-0.0017	0.0544	-0.0136	305	0.0654	-0.0046	0.0651	-0.0152
257	0.0555	-0.0017	0.0573	-0.0049	306	0.0657	-0.0047	0.0514	-0.0181
258	0.0557	-0.0017	0.0546	-0.0057	307	0.0658	-0.0047	0.0453	-0.0172
259	0.0559	-0.0018	0.0485	-0.0106	308	0.0660	-0.0048	0.0629	-0.0291
260	0.0561	-0.0018	0.0409	0.0013	309	0.0663	-0.0049	0.0539	-0.0306
261	0.0562	-0.0018	0.0455	0.0015	310	0.0665	-0.0050	0.0457	-0.0200
262	0.0564	-0.0018	0.0579	-0.0074	311	0.0666	-0.0051	0.0497	-0.0249
263	0.0567	-0.0018	0.0581	-0.0224	312	0.0669	-0.0052	0.0584	-0.0221
264	0.0569	-0.0020	0.0473	-0.0158	313	0.0671	-0.0053	0.0606	-0.0144
265	0.0571	-0.0020	0.0518	-0.0183	314	0.0673	-0.0053	0.0461	-0.0085
266	0.0573	-0.0021	0.0539	-0.0329	315	0.0675	-0.0053	0.0472	0.0017
267	0.0575	-0.0022	0.0461	-0.0135	316	0.0677	-0.0053	0.0571	0.0014
268	0.0577	-0.0022	0.0501	-0.0191	317	0.0679	-0.0053	0.0596	-0.0099
269	0.0579	-0.0024	0.0529	-0.0290	318	0.0682	-0.0054	0.0549	-0.0054
270	0.0581	-0.0025	0.0504	-0.0254	319	0.0684	-0.0054	0.0582	0.0090
271	0.0583	-0.0026	0.0556	-0.0147	320	0.0687	-0.0053	0.0644	-0.0094
272	0.0586	-0.0026	0.0467	-0.0118	321	0.0689	-0.0055	0.0547	-0.0148
273	0.0587	-0.0027	0.0431	-0.0172	322	0.0691	-0.0055	0.0463	-0.0133
274	0.0589	-0.0027	0.0542	-0.0142	323	0.0693	-0.0056	0.0467	-0.0282
275	0.0591	-0.0028	0.0582	-0.0134	324	0.0695	-0.0057	0.0534	-0.0305
276	0.0594	-0.0028	0.0534	-0.0103	325	0.0697	-0.0058	0.0571	-0.0239
277	0.0596	-0.0029	0.0458	-0.0061	326	0.0699	-0.0059	0.0588	-0.0155
278	0.0597	-0.0029	0.0519	-0.0109	327	0.0702	-0.0059	0.0537	-0.0180
279	0.0600	-0.0030	0.0612	-0.0126	328	0.0704	-0.0060	0.0497	-0.0191
280	0.0602	-0.0030	0.0511	-0.0065	329	0.0706	-0.0061	0.0466	-0.0065
281	0.0604	-0.0030	0.0413	-0.0166	330	0.0707	-0.0061	0.0515	-0.0037
282	0.0606	-0.0031	0.0554	-0.0352	331	0.0710	-0.0061	0.0510	-0.0084
283	0.0608	-0.0033	0.0556	-0.0325	332	0.0711	-0.0061	0.0572	-0.0054
284	0.0610	-0.0034	0.0384	-0.0181	333	0.0714	-0.0062	0.0668	-0.0162
285	0.0611	-0.0034	0.0478	-0.0156	334	0.0717	-0.0063	0.0508	-0.0057
286	0.0614	-0.0035	0.0573	-0.0158	335	0.0718	-0.0062	0.0535	-0.0016
287	0.0616	-0.0036	0.0515	-0.0135	336	0.0721	-0.0063	0.0629	-0.0171
288	0.0618	-0.0036	0.0483	-0.0057	337	0.0723	-0.0063	0.0555	-0.0219
289	0.0620	-0.0036	0.0569	-0.0086	338	0.0725	-0.0065	0.0526	-0.0220
290	0.0622	-0.0037	0.0589	-0.0165	339	0.0728	-0.0065	0.0561	-0.0215
291	0.0624	-0.0037	0.0446	-0.0137	340	0.0730	-0.0066	0.0507	-0.0179
292	0.0626	-0.0038	0.0469	-0.0029	341	0.0732	-0.0067	0.0525	-0.0079
293	0.0628	-0.0038	0.0483	-0.0180	342	0.0734	-0.0067	0.0583	-0.0149
294	0.0630	-0.0039	0.0584	-0.0303	343	0.0736	-0.0068	0.0496	-0.0196
295	0.0633	-0.0040	0.0548	-0.0296	344	0.0738	-0.0068	0.0466	-0.0153
296	0.0634	-0.0042	0.0449	-0.0269	345	0.0740	-0.0069	0.0573	-0.0092
297	0.0636	-0.0042	0.0574	-0.0178	346	0.0743	-0.0069	0.0568	-0.0025
298	0.0639	-0.0043	0.0505	-0.0196	347	0.0745	-0.0069	0.0509	-0.0148
299	0.0641	-0.0044	0.0362	-0.0188	348	0.0747	-0.0070	0.0471	-0.0072
300	0.0642	-0.0045	0.0522	-0.0127	349	0.0748	-0.0070	-	-
301	0.0645	-0.0045	0.0608	0.0000					

Table B2.2 Raw data of free-rising PP-2.435-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0133	-0.0001	0.0516	0.0031
2	0.0002	0.0000	0.0522	0.0029	66	0.0136	0.0000	0.0532	0.0005
3	0.0004	0.0000	0.0619	0.0047	67	0.0138	-0.0001	0.0559	0.0023
4	0.0007	0.0000	0.0523	0.0000	68	0.0140	0.0000	0.0553	0.0051
5	0.0008	0.0000	0.0573	0.0055	69	0.0142	0.0000	0.0530	0.0006
6	0.0011	0.0001	0.0663	0.0043	70	0.0144	0.0000	0.0475	0.0046
7	0.0014	0.0001	0.0516	-0.0030	71	0.0146	0.0000	0.0489	0.0075
8	0.0015	0.0000	0.0515	-0.0013	72	0.0148	0.0000	0.0480	0.0077
9	0.0018	0.0000	0.0566	0.0037	73	0.0150	0.0001	0.0523	0.0072
10	0.0020	0.0001	0.0524	0.0015	74	0.0152	0.0001	0.0569	0.0055
11	0.0022	0.0001	0.0476	-0.0058	75	0.0154	0.0001	0.0540	0.0080
12	0.0024	0.0000	0.0533	-0.0036	76	0.0157	0.0002	0.0624	0.0055
13	0.0026	0.0000	0.0585	0.0044	77	0.0159	0.0002	0.0626	-0.0019
14	0.0028	0.0001	0.0529	0.0010	78	0.0162	0.0002	0.0602	-0.0013
15	0.0030	0.0000	0.0492	-0.0009	79	0.0164	0.0002	0.0529	-0.0024
16	0.0032	0.0000	0.0513	0.0024	80	0.0166	0.0001	0.0527	0.0001
17	0.0035	0.0001	0.0497	0.0007	81	0.0168	0.0002	0.0579	0.0009
18	0.0036	0.0000	0.0496	-0.0034	82	0.0171	0.0001	0.0564	-0.0058
19	0.0039	0.0000	0.0522	-0.0016	83	0.0173	0.0001	0.0476	-0.0055
20	0.0040	0.0000	0.0558	0.0001	84	0.0174	0.0001	0.0504	-0.0055
21	0.0043	0.0000	0.0630	-0.0012	85	0.0177	0.0001	0.0536	-0.0078
22	0.0045	0.0000	0.0502	-0.0040	86	0.0179	0.0000	0.0504	-0.0038
23	0.0047	0.0000	0.0522	-0.0021	87	0.0181	0.0000	0.0484	-0.0014
24	0.0050	0.0000	0.0628	0.0044	88	0.0183	0.0000	0.0545	-0.0045
25	0.0052	0.0000	0.0557	0.0006	89	0.0185	0.0000	0.0713	-0.0055
26	0.0054	0.0000	0.0474	-0.0024	90	0.0188	0.0000	0.0602	-0.0011
27	0.0056	0.0000	0.0528	-0.0020	91	0.0190	0.0000	0.0531	0.0012
28	0.0058	0.0000	0.0548	0.0005	92	0.0193	0.0000	0.0583	-0.0004
29	0.0060	0.0000	0.0564	0.0009	93	0.0195	0.0000	0.0540	-0.0035
30	0.0063	0.0000	0.0496	-0.0047	94	0.0197	0.0000	0.0518	0.0005
31	0.0064	0.0000	0.0454	-0.0040	95	0.0199	0.0000	0.0533	-0.0003
32	0.0066	0.0000	0.0552	0.0027	96	0.0201	0.0000	0.0556	0.0017
33	0.0069	0.0000	0.0510	0.0010	97	0.0203	0.0000	0.0532	0.0024
34	0.0070	0.0000	0.0482	-0.0030	98	0.0205	0.0000	0.0477	-0.0017
35	0.0072	0.0000	0.0515	-0.0041	99	0.0207	0.0000	0.0554	0.0002
36	0.0075	-0.0001	0.0525	-0.0035	100	0.0210	0.0000	0.0630	0.0007
37	0.0077	0.0000	0.0549	-0.0015	101	0.0212	0.0000	0.0556	0.0034
38	0.0079	-0.0001	0.0507	-0.0036	102	0.0214	0.0000	0.0593	-0.0032
39	0.0081	-0.0001	0.0458	-0.0050	103	0.0217	0.0000	0.0568	-0.0009
40	0.0083	-0.0001	0.0469	-0.0030	104	0.0219	0.0000	0.0506	0.0024
41	0.0084	-0.0001	0.0492	0.0023	105	0.0221	0.0000	0.0512	-0.0019
42	0.0087	-0.0001	0.0541	0.0020	106	0.0223	0.0000	0.0589	-0.0001
43	0.0089	-0.0001	0.0507	-0.0079	107	0.0226	0.0000	0.0573	-0.0032
44	0.0091	-0.0001	0.0490	-0.0063	108	0.0227	0.0000	0.0459	0.0010
45	0.0093	-0.0001	0.0542	-0.0023	109	0.0229	0.0000	0.0483	0.0024
46	0.0095	-0.0002	0.0537	-0.0018	110	0.0231	0.0000	0.0542	0.0013
47	0.0097	-0.0002	0.0454	0.0037	111	0.0234	0.0000	0.0504	0.0017
48	0.0099	-0.0001	0.0437	-0.0008	112	0.0235	0.0000	0.0469	-0.0032
49	0.0100	-0.0002	0.0533	0.0002	113	0.0237	0.0000	0.0494	0.0011
50	0.0103	-0.0001	0.0551	0.0029	114	0.0239	0.0000	0.0563	0.0036
51	0.0105	-0.0001	0.0546	0.0014	115	0.0242	0.0000	0.0535	-0.0001
52	0.0107	-0.0001	0.0520	0.0030	116	0.0244	0.0000	0.0471	-0.0010
53	0.0109	-0.0001	0.0492	0.0019	117	0.0246	0.0000	0.0467	0.0033
54	0.0111	-0.0001	0.0500	0.0018	118	0.0247	0.0000	0.0600	0.0016
55	0.0113	-0.0001	0.0503	0.0033	119	0.0250	0.0000	0.0678	-0.0009
56	0.0115	-0.0001	0.0474	0.0004	120	0.0253	0.0000	0.0509	0.0032
57	0.0117	-0.0001	0.0510	0.0015	121	0.0255	0.0000	0.0537	0.0029
58	0.0119	-0.0001	0.0538	-0.0014	122	0.0257	0.0000	0.0617	-0.0020
59	0.0121	-0.0001	0.0510	0.0008	123	0.0259	0.0000	0.0567	-0.0009
60	0.0123	-0.0001	0.0543	0.0041	124	0.0262	0.0000	0.0446	0.0039
61	0.0125	-0.0001	0.0533	-0.0008	125	0.0263	0.0001	0.0480	0.0043
62	0.0128	-0.0001	0.0494	0.0001	126	0.0265	0.0001	0.0548	0.0044
63	0.0129	-0.0001	0.0483	0.0016	127	0.0267	0.0001	0.0557	0.0010
64	0.0131	-0.0001	0.0491	0.0008	128	0.0270	0.0001	0.0530	-0.0057

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0272	0.0000	0.0557	-0.0035	176	0.0367	0.0000	0.0547	0.0014
130	0.0274	0.0001	0.0527	-0.0056	177	0.0369	0.0000	0.0459	0.0060
131	0.0276	0.0000	0.0462	-0.0061	178	0.0371	0.0000	0.0489	0.0012
132	0.0278	0.0000	0.0483	-0.0031	179	0.0373	0.0000	0.0550	-0.0027
133	0.0280	0.0000	0.0436	-0.0050	180	0.0375	0.0000	0.0512	-0.0007
134	0.0282	0.0000	0.0555	-0.0016	181	0.0377	0.0000	0.0472	-0.0008
135	0.0284	0.0000	0.0611	-0.0022	182	0.0379	0.0000	0.0463	-0.0054
136	0.0286	-0.0001	0.0470	-0.0090	183	0.0380	0.0000	0.0388	-0.0033
137	0.0288	-0.0001	0.0530	-0.0064	184	0.0382	0.0000	0.0451	0.0013
138	0.0291	-0.0001	0.0504	0.0055	185	0.0384	0.0000	0.0466	0.0034
139	0.0292	-0.0001	0.0446	0.0026	186	0.0386	0.0000	0.0443	0.0008
140	0.0294	-0.0001	0.0515	-0.0024	187	0.0388	0.0000	0.0451	-0.0015
141	0.0296	-0.0001	0.0453	-0.0007	188	0.0389	0.0000	0.0463	-0.0002
142	0.0298	-0.0001	0.0513	-0.0036	189	0.0391	0.0000	0.0500	0.0019
143	0.0300	-0.0001	0.0578	-0.0024	190	0.0393	0.0000	0.0476	0.0007
144	0.0302	-0.0001	0.0535	0.0039	191	0.0395	0.0000	0.0437	-0.0031
145	0.0304	-0.0001	0.0511	0.0012	192	0.0397	0.0000	0.0404	-0.0029
146	0.0307	-0.0001	0.0509	0.0012	193	0.0398	0.0000	0.0462	-0.0015
147	0.0309	-0.0001	0.0504	0.0011	194	0.0401	0.0000	0.0456	0.0004
148	0.0311	-0.0001	0.0450	-0.0050	195	0.0402	0.0000	0.0444	0.0038
149	0.0312	-0.0001	0.0466	-0.0019	196	0.0404	0.0000	0.0454	0.0026
150	0.0314	-0.0001	0.0508	-0.0025	197	0.0406	0.0000	0.0498	-0.0017
151	0.0316	-0.0001	0.0591	0.0013	198	0.0408	0.0000	0.0506	0.0021
152	0.0319	-0.0001	0.0546	0.0047	199	0.0410	0.0000	0.0475	0.0043
153	0.0321	-0.0001	0.0484	0.0028	200	0.0412	0.0000	0.0517	0.0026
154	0.0323	-0.0001	0.0505	0.0048	201	0.0414	0.0000	0.0479	-0.0006
155	0.0325	-0.0001	0.0475	0.0019	202	0.0416	0.0000	0.0483	-0.0033
156	0.0327	-0.0001	0.0470	-0.0014	203	0.0418	0.0000	0.0552	0.0005
157	0.0328	-0.0001	0.0480	0.0031	204	0.0420	0.0000	0.0483	-0.0004
158	0.0331	0.0000	0.0504	0.0042	205	0.0422	0.0000	0.0465	-0.0017
159	0.0332	0.0000	0.0553	0.0056	206	0.0424	0.0000	0.0508	0.0021
160	0.0335	0.0000	0.0566	-0.0005	207	0.0426	0.0000	0.0508	0.0021
161	0.0337	0.0000	0.0466	-0.0022	208	0.0428	0.0000	0.0470	-0.0012
162	0.0339	0.0000	0.0446	0.0063	209	0.0429	0.0000	0.0488	-0.0023
163	0.0341	0.0000	0.0485	0.0029	210	0.0432	0.0000	0.0557	0.0006
164	0.0343	0.0000	0.0507	0.0024	211	0.0434	0.0000	0.0566	0.0015
165	0.0345	0.0000	0.0513	-0.0008	212	0.0436	0.0000	0.0514	-0.0016
166	0.0347	0.0000	0.0493	-0.0004	213	0.0438	0.0000	0.0442	-0.0016
167	0.0349	0.0000	0.0569	-0.0002	214	0.0440	0.0000	0.0467	0.0009
168	0.0351	0.0000	0.0528	-0.0014	215	0.0442	0.0000	0.0542	-0.0001
169	0.0353	0.0000	0.0458	-0.0002	216	0.0444	0.0000	0.0525	0.0011
170	0.0355	0.0000	0.0476	0.0017	217	0.0446	0.0000	0.0490	0.0027
171	0.0357	0.0000	0.0507	-0.0024	218	0.0448	0.0000	0.0483	-0.0056
172	0.0359	0.0000	0.0520	0.0009	219	0.0450	0.0000	0.0500	-0.0048
173	0.0361	0.0000	0.0445	0.0034	220	0.0452	0.0000	0.0505	0.0005
174	0.0363	0.0000	0.0459	-0.0063	221	0.0454	0.0000	0.0496	-0.0027
175	0.0364	0.0000	0.0562	-0.0058	222	0.0456	-0.0001	-	-

Table B2.3 Raw data of free-rising PP-3.050-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0191	0.0009	0.0797	0.0058
2	0.0003	0.0000	0.0796	0.0050	66	0.0195	0.0009	0.0740	0.0052
3	0.0006	0.0000	0.0771	0.0020	67	0.0197	0.0009	0.0868	0.0059
4	0.0009	0.0001	0.0704	0.0042	68	0.0202	0.0009	0.0881	0.0025
5	0.0012	0.0001	0.0792	0.0017	69	0.0204	0.0009	0.0744	0.0051
6	0.0015	0.0001	0.0736	-0.0001	70	0.0207	0.0010	0.0793	0.0088
7	0.0018	0.0001	0.0655	0.0018	71	0.0211	0.0010	0.0774	0.0028
8	0.0021	0.0001	0.0739	0.0024	72	0.0214	0.0010	0.0730	0.0017
9	0.0024	0.0001	0.0687	-0.0019	73	0.0217	0.0010	0.0692	0.0031
10	0.0026	0.0001	0.0656	-0.0009	74	0.0219	0.0010	0.0695	0.0183
11	0.0029	0.0001	0.0755	0.0020	75	0.0222	0.0012	0.0838	0.0218
12	0.0032	0.0001	0.0736	0.0022	76	0.0226	0.0012	0.0890	0.0095
13	0.0035	0.0001	0.0768	0.0034	77	0.0229	0.0012	0.0737	0.0030
14	0.0038	0.0001	0.0771	0.0022	78	0.0232	0.0012	0.0708	-0.0023
15	0.0041	0.0001	0.0680	0.0048	79	0.0235	0.0012	0.0771	-0.0036
16	0.0044	0.0001	0.0735	0.0084	80	0.0238	0.0012	0.0748	-0.0081
17	0.0047	0.0002	0.0795	0.0022	81	0.0241	0.0011	0.0723	-0.0061
18	0.0050	0.0002	0.0790	-0.0020	82	0.0244	0.0011	0.0762	-0.0017
19	0.0053	0.0002	0.0741	0.0024	83	0.0247	0.0011	0.0812	-0.0024
20	0.0056	0.0002	0.0681	0.0016	84	0.0250	0.0011	0.0718	-0.0024
21	0.0059	0.0002	0.0689	0.0021	85	0.0253	0.0011	0.0718	-0.0036
22	0.0061	0.0002	0.0737	0.0021	86	0.0256	0.0011	0.0789	-0.0026
23	0.0065	0.0002	0.0692	-0.0017	87	0.0259	0.0011	0.0784	-0.0002
24	0.0067	0.0002	0.0687	-0.0030	88	0.0262	0.0011	0.0769	0.0010
25	0.0070	0.0002	0.0716	0.0019	89	0.0265	0.0011	0.0736	0.0074
26	0.0073	0.0002	0.0703	0.0173	90	0.0268	0.0012	0.0717	0.0064
27	0.0076	0.0003	0.0815	0.0222	91	0.0271	0.0012	0.0796	0.0015
28	0.0079	0.0004	0.0757	0.0161	92	0.0275	0.0012	0.0774	0.0051
29	0.0082	0.0004	0.0675	0.0120	93	0.0277	0.0012	0.0722	0.0024
30	0.0085	0.0005	0.0781	0.0032	94	0.0280	0.0012	0.0818	0.0048
31	0.0088	0.0005	0.0796	0.0017	95	0.0284	0.0012	0.0808	0.0060
32	0.0091	0.0005	0.0744	0.0053	96	0.0287	0.0012	0.0699	-0.0002
33	0.0094	0.0005	0.0735	0.0045	97	0.0289	0.0012	0.0722	0.0017
34	0.0097	0.0005	0.0711	0.0039	98	0.0293	0.0012	0.0806	0.0008
35	0.0100	0.0005	0.0842	0.0020	99	0.0296	0.0012	0.0819	-0.0009
36	0.0104	0.0005	0.0759	-0.0037	100	0.0299	0.0012	0.0726	0.0043
37	0.0106	0.0005	0.0673	-0.0032	101	0.0302	0.0013	0.0712	0.0022
38	0.0109	0.0005	0.0786	-0.0008	102	0.0305	0.0013	0.0784	-0.0015
39	0.0112	0.0005	0.0776	-0.0040	103	0.0308	0.0013	0.0781	-0.0005
40	0.0115	0.0005	0.0800	-0.0024	104	0.0311	0.0013	0.0736	-0.0038
41	0.0118	0.0005	0.0744	-0.0016	105	0.0314	0.0012	0.0756	-0.0005
42	0.0121	0.0005	0.0686	-0.0063	106	0.0317	0.0012	0.0752	0.0003
43	0.0124	0.0004	0.0686	-0.0033	107	0.0320	0.0012	0.0777	-0.0054
44	0.0127	0.0004	0.0756	0.0008	108	0.0323	0.0012	0.0745	-0.0043
45	0.0130	0.0004	0.0768	-0.0026	109	0.0326	0.0012	0.0706	-0.0039
46	0.0133	0.0004	0.0794	-0.0030	110	0.0329	0.0012	0.0793	-0.0004
47	0.0136	0.0004	0.0839	-0.0012	111	0.0332	0.0012	0.0785	0.0013
48	0.0140	0.0004	0.0740	0.0001	112	0.0335	0.0012	0.0742	-0.0002
49	0.0142	0.0004	0.0742	-0.0010	113	0.0338	0.0012	0.0766	0.0018
50	0.0145	0.0004	0.0771	0.0023	114	0.0341	0.0012	0.0794	0.0011
51	0.0148	0.0004	0.0766	0.0035	115	0.0344	0.0012	0.0767	-0.0004
52	0.0152	0.0004	0.0699	0.0030	116	0.0347	0.0012	0.0749	-0.0004
53	0.0154	0.0005	0.0678	0.0061	117	0.0350	0.0012	0.0694	-0.0004
54	0.0157	0.0005	0.0805	0.0049	118	0.0353	0.0012	0.0749	-0.0009
55	0.0160	0.0005	0.0777	0.0027	119	0.0356	0.0012	0.0835	-0.0003
56	0.0163	0.0005	0.0730	0.0022	120	0.0360	0.0012	0.0761	0.0005
57	0.0166	0.0005	0.0765	0.0047	121	0.0362	0.0012	0.0687	-0.0012
58	0.0169	0.0005	0.0758	0.0059	122	0.0365	0.0012	0.0697	-0.0013
59	0.0172	0.0006	0.0768	0.0027	123	0.0368	0.0012	0.0707	0.0004
60	0.0176	0.0006	0.0767	0.0073	124	0.0371	0.0012	0.0716	-0.0006
61	0.0179	0.0006	0.0751	0.0235	125	0.0374	0.0012	0.0700	0.0019
62	0.0182	0.0008	0.0849	0.0246	126	0.0376	0.0012	0.0705	-0.0005
63	0.0185	0.0008	0.0833	0.0109	127	0.0379	0.0012	0.0685	0.0001
64	0.0188	0.0008	0.0768	0.0048	128	0.0382	0.0012	0.0655	0.0030

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0385	0.0012	0.0766	-0.0006	195	0.0568	0.0013	0.0705	0.0026
130	0.0388	0.0012	0.0782	-0.0021	196	0.0571	0.0013	0.0632	-0.0010
131	0.0391	0.0012	0.0715	-0.0006	197	0.0573	0.0013	0.0651	-0.0032
132	0.0394	0.0012	0.0728	0.0034	198	0.0576	0.0012	0.0682	-0.0039
133	0.0397	0.0012	0.0677	0.0001	199	0.0579	0.0012	0.0616	-0.0013
134	0.0399	0.0012	0.0659	-0.0009	200	0.0581	0.0012	0.0660	0.0009
135	0.0402	0.0012	0.0745	0.0016	201	0.0584	0.0012	0.0758	-0.0003
136	0.0405	0.0012	0.0775	0.0008	202	0.0587	0.0012	0.0629	-0.0016
137	0.0408	0.0012	0.0710	-0.0009	203	0.0589	0.0012	0.0657	-0.0013
138	0.0411	0.0012	0.0739	0.0022	204	0.0592	0.0012	0.0711	-0.0001
139	0.0414	0.0012	0.0710	0.0009	205	0.0595	0.0012	0.0573	0.0005
140	0.0417	0.0012	0.0647	-0.0033	206	0.0597	0.0012	0.0698	0.0002
141	0.0419	0.0012	0.0711	0.0024	207	0.0600	0.0012	0.0786	0.0003
142	0.0422	0.0012	0.0703	0.0009	208	0.0603	0.0012	0.0610	-0.0027
143	0.0425	0.0012	0.0701	-0.0058	209	0.0605	0.0012	0.0642	-0.0019
144	0.0428	0.0012	0.0717	-0.0062	210	0.0608	0.0012	0.0625	0.0022
145	0.0431	0.0012	0.0665	-0.0048	211	0.0610	0.0012	0.0528	0.0027
146	0.0433	0.0011	0.0685	-0.0014	212	0.0613	0.0012	0.0666	-0.0008
147	0.0436	0.0011	0.0703	0.0042	213	0.0616	0.0012	0.0677	0.0014
148	0.0439	0.0012	0.0647	0.0028	214	0.0618	0.0012	0.0628	0.0025
149	0.0441	0.0012	0.0656	0.0005	215	0.0621	0.0012	0.0571	0.0013
150	0.0444	0.0012	0.0681	0.0047	216	0.0623	0.0012	0.0574	0.0026
151	0.0447	0.0012	0.0672	0.0023	217	0.0625	0.0012	0.0659	0.0036
152	0.0449	0.0012	0.0681	-0.0015	218	0.0628	0.0013	0.0628	0.0030
153	0.0452	0.0012	0.0713	-0.0002	219	0.0630	0.0013	0.0638	0.0017
154	0.0455	0.0012	0.0705	0.0003	220	0.0633	0.0013	0.0693	0.0002
155	0.0458	0.0012	0.0708	0.0003	221	0.0636	0.0013	0.0643	-0.0020
156	0.0461	0.0012	0.0687	0.0008	222	0.0638	0.0013	0.0658	0.0005
157	0.0463	0.0012	0.0634	-0.0002	223	0.0641	0.0013	0.0710	0.0038
158	0.0466	0.0012	0.0650	0.0006	224	0.0644	0.0013	0.0602	0.0022
159	0.0468	0.0012	0.0673	0.0012	225	0.0646	0.0013	0.0638	0.0006
160	0.0471	0.0012	0.0714	-0.0015	226	0.0649	0.0013	0.0639	0.0012
161	0.0474	0.0012	0.0794	-0.0025	227	0.0651	0.0013	0.0555	-0.0011
162	0.0478	0.0012	0.0721	0.0006	228	0.0653	0.0013	0.0648	0.0027
163	0.0480	0.0012	0.0677	-0.0007	229	0.0656	0.0013	0.0698	0.0048
164	0.0483	0.0012	0.0745	-0.0016	230	0.0659	0.0013	0.0587	0.0022
165	0.0486	0.0012	0.0679	0.0005	231	0.0661	0.0013	0.0560	0.0026
166	0.0488	0.0012	0.0702	0.0024	232	0.0663	0.0013	0.0670	0.0011
167	0.0492	0.0012	0.0721	0.0027	233	0.0666	0.0013	0.0675	0.0048
168	0.0494	0.0012	0.0615	0.0018	234	0.0669	0.0014	0.0586	0.0050
169	0.0496	0.0012	0.0672	0.0027	235	0.0671	0.0014	0.0641	0.0044
170	0.0500	0.0012	0.0751	-0.0001	236	0.0674	0.0014	0.0693	0.0017
171	0.0502	0.0012	0.0654	0.0011	237	0.0676	0.0014	0.0587	0.0007
172	0.0505	0.0012	0.0674	0.0019	238	0.0679	0.0014	0.0603	0.0167
173	0.0508	0.0012	0.0710	-0.0001	239	0.0681	0.0015	0.0662	0.0256
174	0.0510	0.0012	0.0599	0.0008	240	0.0684	0.0016	0.0589	0.0148
175	0.0513	0.0012	0.0685	0.0002	241	0.0686	0.0017	0.0614	0.0078
176	0.0516	0.0012	0.0785	-0.0005	242	0.0689	0.0017	0.0670	0.0084
177	0.0519	0.0012	0.0752	-0.0020	243	0.0691	0.0017	0.0630	0.0046
178	0.0522	0.0012	0.0679	-0.0047	244	0.0694	0.0017	0.0574	0.0014
179	0.0524	0.0012	0.0698	-0.0028	245	0.0696	0.0017	0.0605	0.0025
180	0.0528	0.0012	0.0720	-0.0023	246	0.0699	0.0017	0.0665	0.0062
181	0.0530	0.0012	0.0665	-0.0031	247	0.0701	0.0018	0.0613	0.0033
182	0.0533	0.0012	0.0708	-0.0039	248	0.0704	0.0018	0.0653	0.0001
183	0.0536	0.0011	0.0687	-0.0030	249	0.0706	0.0018	0.0700	-0.0011
184	0.0538	0.0011	0.0658	-0.0008	250	0.0709	0.0018	0.0618	0.0002
185	0.0541	0.0011	0.0732	0.0027	251	0.0711	0.0018	0.0659	0.0028
186	0.0544	0.0012	0.0688	0.0031	252	0.0714	0.0018	0.0743	0.0033
187	0.0547	0.0012	0.0614	-0.0002	253	0.0717	0.0018	0.0592	0.0021
188	0.0549	0.0012	0.0684	0.0027	254	0.0719	0.0018	0.0633	-0.0015
189	0.0552	0.0012	0.0702	0.0033	255	0.0722	0.0018	0.0747	0.0033
190	0.0555	0.0012	0.0625	0.0008	256	0.0725	0.0018	0.0580	0.0170
191	0.0557	0.0012	0.0685	0.0048	257	0.0727	0.0019	0.0648	0.0214
192	0.0560	0.0012	0.0683	0.0060	258	0.0730	0.0020	0.0669	0.0149
193	0.0563	0.0012	0.0626	-0.0005	259	0.0732	0.0021	0.0589	0.0082
194	0.0565	0.0012	0.0724	0.0022	260	0.0735	0.0021	0.0672	0.0048

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
261	0.0738	0.0021	0.0639	0.0063	327	0.0913	0.0025	0.0673	0.0050
262	0.0740	0.0021	0.0582	0.0061	328	0.0915	0.0025	0.0573	0.0032
263	0.0742	0.0021	0.0568	0.0039	329	0.0918	0.0025	0.0557	0.0016
264	0.0745	0.0022	0.0619	0.0041	330	0.0920	0.0025	0.0588	-0.0004
265	0.0747	0.0022	0.0695	0.0050	331	0.0922	0.0025	0.0659	-0.0039
266	0.0750	0.0022	0.0618	0.0011	332	0.0925	0.0025	0.0653	-0.0028
267	0.0752	0.0022	0.0661	0.0025	333	0.0928	0.0025	0.0649	0.0053
268	0.0756	0.0022	0.0721	0.0052	334	0.0930	0.0025	0.0638	0.0048
269	0.0758	0.0022	0.0589	-0.0037	335	0.0933	0.0025	0.0635	-0.0014
270	0.0760	0.0022	0.0625	-0.0056	336	0.0935	0.0025	0.0716	-0.0011
271	0.0763	0.0022	0.0771	0.0023	337	0.0938	0.0025	0.0693	-0.0027
272	0.0766	0.0022	0.0690	-0.0004	338	0.0941	0.0025	0.0634	-0.0052
273	0.0769	0.0022	0.0633	-0.0029	339	0.0943	0.0025	0.0732	0.0036
274	0.0771	0.0022	0.0711	0.0032	340	0.0947	0.0025	0.0675	0.0028
275	0.0774	0.0022	0.0633	0.0019	341	0.0949	0.0025	0.0607	-0.0038
276	0.0777	0.0022	0.0644	0.0008	342	0.0951	0.0025	0.0676	0.0020
277	0.0779	0.0022	0.0716	0.0011	343	0.0954	0.0025	0.0595	0.0009
278	0.0782	0.0022	0.0660	-0.0036	344	0.0956	0.0025	0.0563	-0.0063
279	0.0785	0.0022	0.0691	-0.0012	345	0.0959	0.0025	0.0688	0.0008
280	0.0788	0.0022	0.0725	0.0002	346	0.0962	0.0025	0.0640	0.0034
281	0.0791	0.0022	0.0602	0.0014	347	0.0964	0.0025	0.0616	-0.0015
282	0.0793	0.0022	0.0668	0.0066	348	0.0967	0.0025	0.0712	-0.0001
283	0.0796	0.0022	0.0775	0.0023	349	0.0970	0.0025	0.0674	0.0021
284	0.0799	0.0022	0.0644	0.0028	350	0.0972	0.0025	0.0626	0.0012
285	0.0801	0.0023	0.0616	0.0160	351	0.0975	0.0025	0.0592	-0.0035
286	0.0804	0.0023	0.0605	0.0243	352	0.0977	0.0025	0.0623	0.0002
287	0.0806	0.0025	0.0605	0.0174	353	0.0980	0.0025	0.0651	0.0052
288	0.0809	0.0025	0.0679	0.0061	354	0.0982	0.0025	0.0601	-0.0018
289	0.0811	0.0025	0.0654	0.0027	355	0.0984	0.0025	0.0684	0.0008
290	0.0814	0.0025	0.0660	0.0036	356	0.0987	0.0025	0.0693	0.0016
291	0.0817	0.0025	0.0682	0.0039	357	0.0990	0.0025	0.0614	-0.0041
292	0.0819	0.0025	0.0667	0.0000	358	0.0992	0.0025	0.0719	0.0013
293	0.0822	0.0025	0.0687	-0.0001	359	0.0996	0.0025	0.0718	0.0020
294	0.0825	0.0025	0.0640	0.0008	360	0.0998	0.0025	0.0591	-0.0014
295	0.0827	0.0025	0.0602	0.0017	361	0.1000	0.0025	0.0662	-0.0016
296	0.0830	0.0026	0.0725	-0.0006	362	0.1003	0.0025	0.0725	0.0021
297	0.0833	0.0025	0.0723	-0.0025	363	0.1006	0.0025	0.0627	-0.0026
298	0.0835	0.0025	0.0603	-0.0002	364	0.1008	0.0025	0.0656	-0.0027
299	0.0838	0.0025	0.0710	-0.0024	365	0.1011	0.0025	0.0753	0.0044
300	0.0841	0.0025	0.0709	-0.0009	366	0.1014	0.0025	0.0672	0.0008
301	0.0843	0.0025	0.0605	-0.0001	367	0.1017	0.0025	0.0654	0.0011
302	0.0846	0.0025	0.0700	-0.0018	368	0.1020	0.0025	0.0726	0.0028
303	0.0849	0.0025	0.0700	0.0014	369	0.1023	0.0025	0.0605	-0.0046
304	0.0851	0.0025	0.0617	0.0004	370	0.1025	0.0025	0.0625	-0.0008
305	0.0854	0.0025	0.0687	-0.0020	371	0.1028	0.0025	0.0645	0.0030
306	0.0857	0.0025	0.0734	-0.0008	372	0.1030	0.0025	0.0590	-0.0058
307	0.0860	0.0025	0.0644	0.0010	373	0.1032	0.0025	0.0689	0.0001
308	0.0862	0.0025	0.0691	0.0008	374	0.1035	0.0025	0.0625	0.0027
309	0.0865	0.0025	0.0708	-0.0039	375	0.1037	0.0025	0.0581	0.0002
310	0.0868	0.0025	0.0607	0.0011	376	0.1040	0.0025	0.0597	0.0021
311	0.0870	0.0025	0.0703	0.0033	377	0.1042	0.0025	0.0631	-0.0023
312	0.0873	0.0025	0.0715	-0.0023	378	0.1045	0.0025	0.0625	0.0000
313	0.0876	0.0025	0.0633	-0.0005	379	0.1047	0.0025	0.0611	-0.0002
314	0.0878	0.0025	0.0687	-0.0001	380	0.1050	0.0025	0.0641	-0.0038
315	0.0881	0.0025	0.0690	-0.0031	381	0.1052	0.0025	0.0654	0.0028
316	0.0884	0.0025	0.0615	-0.0034	382	0.1055	0.0025	0.0642	0.0004
317	0.0886	0.0025	0.0723	0.0012	383	0.1057	0.0025	0.0652	-0.0042
318	0.0890	0.0025	0.0699	0.0023	384	0.1060	0.0025	0.0697	0.0005
319	0.0892	0.0025	0.0569	-0.0035	385	0.1063	0.0025	0.0661	0.0029
320	0.0894	0.0025	0.0710	-0.0020	386	0.1066	0.0025	0.0651	0.0029
321	0.0898	0.0025	0.0718	0.0012	387	0.1068	0.0025	0.0582	-0.0014
322	0.0900	0.0025	0.0634	-0.0002	388	0.1070	0.0025	0.0558	-0.0033
323	0.0903	0.0025	0.0682	0.0046	389	0.1073	0.0025	0.0676	0.0002
324	0.0905	0.0025	0.0605	0.0011	390	0.1076	0.0025	0.0684	0.0010
325	0.0907	0.0025	0.0541	-0.0070	391	0.1078	0.0025	0.0643	-0.0005
326	0.0910	0.0025	0.0692	0.0003	392	0.1081	0.0025	-	-

Table B2.4 Raw data of free-rising PP-3.211-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0191	-0.0001	0.0687	0.0011
2	0.0002	0.0000	0.0664	-0.0032	66	0.0194	-0.0001	0.0722	-0.0017
3	0.0005	0.0000	0.0781	-0.0014	67	0.0197	-0.0001	0.0724	-0.0072
4	0.0008	0.0000	0.0672	0.0024	68	0.0200	-0.0001	0.0758	0.0002
5	0.0011	0.0000	0.0788	-0.0016	69	0.0203	-0.0001	0.0724	0.0051
6	0.0015	0.0000	0.0858	-0.0023	70	0.0206	-0.0001	0.0801	0.0010
7	0.0018	0.0000	0.0740	-0.0004	71	0.0209	-0.0001	0.0742	0.0042
8	0.0020	0.0000	0.0791	-0.0003	72	0.0212	-0.0001	0.0641	0.0033
9	0.0024	0.0000	0.0723	0.0014	73	0.0215	-0.0001	0.0758	-0.0017
10	0.0026	0.0000	0.0689	0.0012	74	0.0218	-0.0001	0.0858	-0.0002
11	0.0029	0.0000	0.0738	0.0007	75	0.0221	-0.0001	0.0719	-0.0011
12	0.0032	0.0000	0.0736	0.0021	76	0.0224	-0.0001	0.0669	-0.0009
13	0.0035	0.0000	0.0799	-0.0021	77	0.0227	-0.0001	0.0751	-0.0023
14	0.0039	0.0000	0.0773	0.0004	78	0.0230	-0.0001	0.0703	-0.0023
15	0.0041	0.0000	0.0718	-0.0013	79	0.0232	-0.0001	0.0694	0.0026
16	0.0044	0.0000	0.0789	-0.0032	80	0.0235	-0.0001	0.0727	0.0003
17	0.0048	0.0000	0.0759	-0.0013	81	0.0238	-0.0001	0.0816	-0.0015
18	0.0050	0.0000	0.0701	0.0001	82	0.0242	-0.0001	0.0774	0.0009
19	0.0053	0.0000	0.0773	0.0002	83	0.0244	-0.0001	0.0663	0.0023
20	0.0057	0.0000	0.0766	-0.0013	84	0.0247	-0.0001	0.0735	-0.0002
21	0.0060	0.0000	0.0871	0.0008	85	0.0250	-0.0001	0.0665	0.0016
22	0.0064	0.0000	0.0875	-0.0057	86	0.0252	-0.0001	0.0652	0.0014
23	0.0066	-0.0001	0.0694	-0.0054	87	0.0256	-0.0001	0.0785	0.0013
24	0.0069	-0.0001	0.0756	0.0037	88	0.0259	-0.0001	0.0848	-0.0063
25	0.0073	0.0000	0.0814	0.0043	89	0.0262	-0.0001	0.0774	-0.0041
26	0.0076	0.0000	0.0827	-0.0013	90	0.0265	-0.0001	0.0696	0.0104
27	0.0079	-0.0001	0.0701	0.0012	91	0.0268	0.0000	0.0719	0.0041
28	0.0081	0.0000	0.0681	0.0024	92	0.0271	-0.0001	0.0728	0.0004
29	0.0085	0.0000	0.0833	0.0007	93	0.0274	0.0000	0.0707	0.0013
30	0.0088	0.0000	0.0795	0.0017	94	0.0276	0.0000	0.0648	-0.0010
31	0.0091	0.0000	0.0776	-0.0005	95	0.0279	-0.0001	0.0809	-0.0076
32	0.0094	0.0000	0.0768	-0.0022	96	0.0283	-0.0001	0.0788	-0.0041
33	0.0097	0.0000	0.0698	0.0002	97	0.0285	-0.0001	0.0663	-0.0022
34	0.0100	0.0000	0.0692	-0.0011	98	0.0288	-0.0001	0.0789	-0.0020
35	0.0103	-0.0001	0.0709	-0.0017	99	0.0291	-0.0001	0.0829	-0.0060
36	0.0105	0.0000	0.0766	0.0023	100	0.0295	-0.0002	0.0738	-0.0087
37	0.0109	0.0000	0.0821	-0.0023	101	0.0297	-0.0002	0.0717	0.0037
38	0.0112	-0.0001	0.0685	-0.0020	102	0.0300	-0.0001	0.0748	0.0038
39	0.0114	0.0000	0.0673	0.0010	103	0.0303	-0.0001	0.0771	-0.0011
40	0.0117	-0.0001	0.0828	-0.0037	104	0.0307	-0.0001	0.0733	-0.0007
41	0.0121	-0.0001	0.0807	-0.0077	105	0.0309	-0.0001	0.0776	0.0001
42	0.0124	-0.0001	0.0731	-0.0030	106	0.0313	-0.0001	0.0805	0.0015
43	0.0127	-0.0001	0.0728	0.0017	107	0.0316	-0.0001	0.0807	-0.0029
44	0.0130	-0.0001	0.0724	0.0005	108	0.0319	-0.0002	0.0756	-0.0065
45	0.0133	-0.0001	0.0830	-0.0001	109	0.0322	-0.0002	0.0697	0.0016
46	0.0136	-0.0001	0.0713	0.0000	110	0.0325	-0.0002	0.0783	0.0011
47	0.0138	-0.0001	0.0680	0.0015	111	0.0328	-0.0002	0.0792	-0.0093
48	0.0142	-0.0001	0.0856	0.0024	112	0.0331	-0.0002	0.0733	-0.0255
49	0.0145	-0.0001	0.0780	0.0015	113	0.0334	-0.0004	0.0666	-0.0284
50	0.0148	-0.0001	0.0709	-0.0019	114	0.0336	-0.0005	0.0834	-0.0157
51	0.0151	-0.0001	0.0752	-0.0020	115	0.0341	-0.0005	0.0863	-0.0101
52	0.0154	-0.0001	0.0729	0.0027	116	0.0343	-0.0005	0.0687	-0.0124
53	0.0157	-0.0001	0.0673	0.0031	117	0.0346	-0.0006	0.0723	-0.0058
54	0.0159	-0.0001	0.0688	-0.0008	118	0.0349	-0.0006	0.0771	0.0040
55	0.0162	-0.0001	0.0678	-0.0016	119	0.0352	-0.0006	0.0792	-0.0093
56	0.0165	-0.0001	0.0726	-0.0009	120	0.0355	-0.0007	0.0779	-0.0226
57	0.0168	-0.0001	0.0719	0.0005	121	0.0358	-0.0008	0.0768	-0.0254
58	0.0170	-0.0001	0.0732	-0.0010	122	0.0362	-0.0009	0.0810	-0.0183
59	0.0174	-0.0001	0.0801	0.0005	123	0.0365	-0.0009	0.0798	-0.0083
60	0.0177	-0.0001	0.0697	0.0002	124	0.0368	-0.0009	0.0758	-0.0117
61	0.0179	-0.0001	0.0694	-0.0021	125	0.0371	-0.0010	0.0748	-0.0086
62	0.0182	-0.0001	0.0756	0.0013	126	0.0374	-0.0010	0.0779	-0.0047
63	0.0185	-0.0001	0.0798	0.0002	127	0.0377	-0.0010	0.0783	-0.0183
64	0.0189	-0.0001	0.0726	-0.0012	128	0.0380	-0.0011	0.0751	-0.0259

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0383	-0.0012	0.0710	-0.0176	195	0.0588	-0.0016	0.0768	-0.0034
130	0.0386	-0.0013	0.0809	-0.0036	196	0.0591	-0.0017	0.0708	-0.0034
131	0.0390	-0.0013	0.0846	-0.0057	197	0.0594	-0.0016	0.0721	0.0034
132	0.0393	-0.0013	0.0708	-0.0079	198	0.0597	-0.0016	0.0754	-0.0043
133	0.0395	-0.0013	0.0730	-0.0042	199	0.0600	-0.0017	0.0696	0.0002
134	0.0399	-0.0014	0.0796	-0.0008	200	0.0602	-0.0016	0.0664	0.0027
135	0.0402	-0.0013	0.0875	0.0040	201	0.0605	-0.0016	0.0688	-0.0045
136	0.0406	-0.0013	0.0856	-0.0064	202	0.0608	-0.0017	0.0694	0.0037
137	0.0409	-0.0014	0.0732	-0.0077	203	0.0611	-0.0016	0.0698	0.0048
138	0.0411	-0.0014	0.0744	-0.0038	204	0.0614	-0.0016	0.0711	-0.0051
139	0.0415	-0.0014	0.0816	0.0048	205	0.0616	-0.0017	0.0659	-0.0003
140	0.0418	-0.0014	0.0864	0.0049	206	0.0619	-0.0016	0.0644	0.0035
141	0.0421	-0.0014	0.0852	-0.0034	207	0.0622	-0.0016	0.0691	-0.0068
142	0.0425	-0.0014	0.0790	-0.0009	208	0.0624	-0.0017	0.0690	-0.0038
143	0.0428	-0.0014	0.0783	-0.0002	209	0.0627	-0.0017	0.0670	0.0098
144	0.0431	-0.0014	0.0754	0.0025	210	0.0630	-0.0016	0.0696	0.0001
145	0.0434	-0.0014	0.0837	0.0025	211	0.0633	-0.0017	0.0671	-0.0067
146	0.0438	-0.0014	0.0889	-0.0074	212	0.0635	-0.0017	0.0642	0.0022
147	0.0441	-0.0014	0.0757	-0.0142	213	0.0638	-0.0016	0.0697	0.0038
148	0.0444	-0.0015	0.0778	-0.0199	214	0.0641	-0.0016	0.0667	-0.0014
149	0.0447	-0.0016	0.0759	-0.0112	215	0.0643	-0.0016	0.0637	0.0002
150	0.0450	-0.0016	0.0867	-0.0026	216	0.0646	-0.0016	0.0737	0.0008
151	0.0454	-0.0016	0.0941	-0.0168	217	0.0649	-0.0016	0.0705	-0.0012
152	0.0457	-0.0017	0.0774	-0.0099	218	0.0651	-0.0016	0.0613	0.0017
153	0.0460	-0.0017	0.0796	0.0014	219	0.0654	-0.0016	0.0670	0.0010
154	0.0464	-0.0017	0.0762	0.0029	220	0.0657	-0.0016	0.0714	-0.0014
155	0.0466	-0.0017	0.0795	0.0006	221	0.0660	-0.0016	0.0645	0.0023
156	0.0470	-0.0017	0.0851	-0.0063	222	0.0662	-0.0016	0.0710	-0.0002
157	0.0473	-0.0017	0.0768	-0.0002	223	0.0665	-0.0016	0.0713	-0.0019
158	0.0476	-0.0017	0.0790	0.0002	224	0.0668	-0.0016	0.0602	0.0006
159	0.0479	-0.0017	0.0800	0.0007	225	0.0670	-0.0016	0.0702	0.0022
160	0.0483	-0.0017	0.0853	-0.0049	226	0.0673	-0.0016	0.0651	0.0026
161	0.0486	-0.0017	0.0784	-0.0036	227	0.0675	-0.0016	0.0639	-0.0012
162	0.0489	-0.0017	0.0690	0.0066	228	0.0678	-0.0016	0.0752	0.0023
163	0.0492	-0.0017	0.0789	0.0036	229	0.0681	-0.0016	0.0682	0.0046
164	0.0495	-0.0017	0.0857	0.0024	230	0.0684	-0.0016	0.0647	0.0030
165	0.0499	-0.0017	0.0831	-0.0053	231	0.0687	-0.0016	0.0731	-0.0003
166	0.0502	-0.0017	0.0790	-0.0018	232	0.0690	-0.0016	0.0642	0.0005
167	0.0505	-0.0017	0.0736	0.0052	233	0.0692	-0.0016	0.0597	0.0027
168	0.0508	-0.0017	0.0751	0.0044	234	0.0694	-0.0016	0.0743	0.0000
169	0.0511	-0.0017	0.0880	0.0013	235	0.0698	-0.0016	0.0681	0.0010
170	0.0515	-0.0017	0.0738	-0.0041	236	0.0700	-0.0016	0.0646	0.0014
171	0.0517	-0.0017	0.0733	-0.0031	237	0.0703	-0.0016	0.0724	0.0000
172	0.0521	-0.0017	0.0803	0.0061	238	0.0706	-0.0016	0.0701	-0.0011
173	0.0523	-0.0016	0.0764	-0.0022	239	0.0708	-0.0016	0.0589	0.0010
174	0.0527	-0.0017	0.0827	-0.0044	240	0.0710	-0.0015	0.0696	0.0035
175	0.0530	-0.0017	0.0697	0.0066	241	0.0714	-0.0015	0.0720	0.0007
176	0.0532	-0.0017	0.0673	0.0027	242	0.0716	-0.0015	0.0604	-0.0022
177	0.0535	-0.0017	0.0822	-0.0005	243	0.0719	-0.0016	0.0711	0.0009
178	0.0539	-0.0017	0.0790	-0.0027	244	0.0722	-0.0015	0.0692	0.0089
179	0.0542	-0.0017	0.0689	0.0040	245	0.0724	-0.0015	0.0670	0.0033
180	0.0544	-0.0016	0.0688	0.0011	246	0.0727	-0.0015	0.0719	0.0002
181	0.0547	-0.0017	0.0697	0.0013	247	0.0730	-0.0015	0.0637	0.0036
182	0.0550	-0.0016	0.0741	-0.0022	248	0.0732	-0.0015	0.0603	0.0004
183	0.0553	-0.0017	0.0791	0.0035	249	0.0735	-0.0015	0.0762	-0.0005
184	0.0556	-0.0016	0.0792	0.0020	250	0.0738	-0.0015	0.0682	0.0017
185	0.0559	-0.0017	0.0725	-0.0089	251	0.0740	-0.0015	0.0616	0.0012
186	0.0562	-0.0017	0.0676	0.0009	252	0.0743	-0.0015	0.0735	-0.0025
187	0.0565	-0.0017	0.0663	-0.0023	253	0.0746	-0.0015	0.0673	-0.0010
188	0.0567	-0.0017	0.0675	0.0026	254	0.0749	-0.0015	0.0613	0.0044
189	0.0570	-0.0016	0.0725	0.0065	255	0.0751	-0.0014	0.0714	-0.0029
190	0.0573	-0.0016	0.0736	0.0021	256	0.0754	-0.0015	0.0721	-0.0069
191	0.0576	-0.0016	0.0797	-0.0045	257	0.0757	-0.0015	0.0610	-0.0035
192	0.0580	-0.0017	0.0734	-0.0020	258	0.0759	-0.0015	0.0721	0.0032
193	0.0582	-0.0016	0.0672	0.0057	259	0.0763	-0.0015	0.0679	0.0039
194	0.0585	-0.0016	0.0772	0.0053	260	0.0765	-0.0015	0.0586	-0.0051

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
261	0.0767	-0.0015	0.0765	0.0026	327	0.0950	-0.0012	0.0716	-0.0018
262	0.0771	-0.0015	0.0690	0.0093	328	0.0952	-0.0012	0.0677	-0.0061
263	0.0773	-0.0014	0.0616	-0.0010	329	0.0955	-0.0012	0.0787	-0.0030
264	0.0776	-0.0015	0.0731	0.0035	330	0.0958	-0.0012	0.0705	0.0008
265	0.0779	-0.0014	0.0646	0.0204	331	0.0961	-0.0012	0.0686	0.0007
266	0.0781	-0.0013	0.0635	0.0152	332	0.0964	-0.0012	0.0787	-0.0040
267	0.0784	-0.0013	0.0749	0.0102	333	0.0967	-0.0012	0.0786	0.0007
268	0.0787	-0.0012	0.0707	0.0153	334	0.0970	-0.0012	0.0768	0.0012
269	0.0789	-0.0012	0.0659	0.0096	335	0.0973	-0.0012	0.0721	-0.0029
270	0.0792	-0.0012	0.0655	0.0030	336	0.0976	-0.0012	0.0674	-0.0004
271	0.0795	-0.0011	0.0662	0.0052	337	0.0978	-0.0012	0.0720	-0.0025
272	0.0797	-0.0011	0.0683	0.0018	338	0.0982	-0.0013	0.0725	-0.0015
273	0.0800	-0.0011	0.0694	0.0018	339	0.0984	-0.0012	0.0702	-0.0001
274	0.0803	-0.0011	0.0687	0.0030	340	0.0987	-0.0013	0.0828	-0.0022
275	0.0806	-0.0011	0.0649	-0.0021	341	0.0991	-0.0013	0.0736	-0.0022
276	0.0808	-0.0011	0.0702	-0.0028	342	0.0993	-0.0013	0.0669	-0.0014
277	0.0811	-0.0011	0.0721	-0.0018	343	0.0996	-0.0013	0.0790	0.0010
278	0.0814	-0.0011	0.0641	0.0029	344	0.0999	-0.0013	0.0785	-0.0007
279	0.0816	-0.0011	0.0671	0.0006	345	0.1002	-0.0013	0.0770	-0.0010
280	0.0819	-0.0011	0.0699	-0.0041	346	0.1006	-0.0013	0.0731	0.0018
281	0.0822	-0.0011	0.0662	-0.0013	347	0.1008	-0.0013	0.0707	-0.0027
282	0.0825	-0.0011	0.0777	0.0003	348	0.1011	-0.0013	0.0735	-0.0019
283	0.0828	-0.0011	0.0693	0.0050	349	0.1014	-0.0013	0.0695	0.0033
284	0.0830	-0.0011	0.0576	-0.0026	350	0.1017	-0.0013	0.0705	-0.0031
285	0.0833	-0.0012	0.0670	-0.0016	351	0.1020	-0.0013	0.0879	-0.0006
286	0.0836	-0.0011	0.0683	0.0063	352	0.1024	-0.0013	0.0796	-0.0006
287	0.0838	-0.0011	0.0691	-0.0040	353	0.1026	-0.0013	0.0691	-0.0036
288	0.0841	-0.0011	0.0785	-0.0048	354	0.1029	-0.0013	0.0812	0.0037
289	0.0845	-0.0011	0.0763	0.0036	355	0.1033	-0.0013	0.0762	0.0011
290	0.0847	-0.0011	0.0673	-0.0001	356	0.1035	-0.0013	0.0695	0.0002
291	0.0850	-0.0011	0.0724	-0.0010	357	0.1038	-0.0013	0.0707	0.0061
292	0.0853	-0.0011	0.0684	0.0021	358	0.1041	-0.0012	0.0670	0.0017
293	0.0855	-0.0011	0.0690	0.0000	359	0.1044	-0.0013	0.0712	-0.0026
294	0.0858	-0.0011	0.0750	0.0000	360	0.1047	-0.0013	0.0724	-0.0004
295	0.0861	-0.0011	0.0687	-0.0014	361	0.1049	-0.0013	0.0657	0.0006
296	0.0864	-0.0011	0.0687	-0.0021	362	0.1052	-0.0013	0.0698	-0.0018
297	0.0867	-0.0012	0.0734	0.0000	363	0.1055	-0.0013	0.0722	-0.0005
298	0.0870	-0.0011	0.0646	0.0041	364	0.1058	-0.0013	0.0665	0.0007
299	0.0872	-0.0011	0.0630	-0.0007	365	0.1060	-0.0013	0.0797	-0.0043
300	0.0875	-0.0011	0.0719	-0.0001	366	0.1064	-0.0013	0.0745	-0.0048
301	0.0878	-0.0011	0.0693	0.0022	367	0.1066	-0.0013	0.0685	-0.0047
302	0.0880	-0.0011	0.0723	-0.0035	368	0.1070	-0.0013	0.0810	-0.0030
303	0.0884	-0.0011	0.0716	0.0017	369	0.1073	-0.0013	0.0750	-0.0008
304	0.0886	-0.0011	0.0686	0.0010	370	0.1076	-0.0013	0.0752	-0.0021
305	0.0889	-0.0011	0.0717	-0.0040	371	0.1079	-0.0014	0.0724	0.0008
306	0.0892	-0.0011	0.0658	-0.0019	372	0.1081	-0.0013	0.0718	0.0003
307	0.0894	-0.0012	0.0667	-0.0004	373	0.1084	-0.0014	0.0724	-0.0025
308	0.0897	-0.0012	0.0689	-0.0003	374	0.1087	-0.0014	0.0670	-0.0020
309	0.0900	-0.0012	0.0675	0.0005	375	0.1090	-0.0014	0.0704	-0.0074
310	0.0903	-0.0011	0.0697	-0.0005	376	0.1093	-0.0014	0.0792	-0.0072
311	0.0905	-0.0012	0.0719	0.0008	377	0.1096	-0.0014	0.0744	-0.0162
312	0.0908	-0.0011	0.0634	0.0004	378	0.1099	-0.0015	0.0650	-0.0212
313	0.0911	-0.0012	0.0627	-0.0041	379	0.1101	-0.0016	0.0764	-0.0103
314	0.0913	-0.0012	0.0754	0.0041	380	0.1105	-0.0016	0.0727	-0.0071
315	0.0917	-0.0011	0.0693	0.0007	381	0.1107	-0.0017	0.0645	-0.0087
316	0.0919	-0.0012	0.0615	-0.0066	382	0.1110	-0.0017	0.0775	-0.0066
317	0.0921	-0.0012	0.0733	-0.0009	383	0.1113	-0.0017	0.0784	-0.0011
318	0.0925	-0.0012	0.0705	-0.0018	384	0.1116	-0.0017	0.0713	-0.0041
319	0.0927	-0.0012	0.0616	-0.0016	385	0.1119	-0.0017	0.0738	-0.0055
320	0.0930	-0.0012	0.0686	0.0036	386	0.1122	-0.0018	0.0667	-0.0038
321	0.0933	-0.0012	0.0715	-0.0009	387	0.1124	-0.0018	0.0649	-0.0021
322	0.0935	-0.0012	0.0661	-0.0037	388	0.1127	-0.0018	0.0779	-0.0049
323	0.0938	-0.0012	0.0718	0.0007	389	0.1131	-0.0018	0.0718	-0.0042
324	0.0941	-0.0012	0.0719	0.0006	390	0.1133	-0.0018	0.0657	-0.0012
325	0.0944	-0.0012	0.0624	0.0002	391	0.1136	-0.0018	0.0688	0.0007
326	0.0946	-0.0012	0.0733	0.0024	392	0.1139	-0.0018	-	-

Table B2.5 Raw data of free-rising WD-2.561-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0310	0.0030	0.1347	-0.0321
2	0.0006	0.0001	0.1287	0.0179	66	0.0315	0.0029	0.1119	-0.0228
3	0.0010	0.0001	0.1252	0.0159	67	0.0319	0.0028	0.1097	-0.0242
4	0.0016	0.0002	0.1326	0.0314	68	0.0324	0.0027	0.1157	-0.0223
5	0.0021	0.0004	0.1146	0.0329	69	0.0328	0.0026	0.1051	-0.0211
6	0.0025	0.0005	0.1336	0.0188	70	0.0333	0.0025	0.1094	-0.0223
7	0.0032	0.0005	0.1415	0.0131	71	0.0337	0.0024	0.1184	-0.0204
8	0.0037	0.0006	0.1168	0.0281	72	0.0342	0.0024	0.1182	-0.0117
9	0.0041	0.0008	0.1347	0.0367	73	0.0346	0.0023	0.1123	-0.0246
10	0.0047	0.0009	0.1276	0.0418	74	0.0351	0.0022	0.1267	-0.0358
11	0.0051	0.0011	0.1201	0.0430	75	0.0356	0.0020	0.1199	-0.0267
12	0.0057	0.0012	0.1317	0.0286	76	0.0361	0.0019	0.1169	-0.0153
13	0.0062	0.0013	0.1178	0.0306	77	0.0366	0.0019	0.1264	-0.0110
14	0.0066	0.0015	0.1157	0.0428	78	0.0371	0.0019	0.1304	-0.0169
15	0.0071	0.0017	0.1082	0.0396	79	0.0376	0.0018	0.1368	-0.0185
16	0.0075	0.0018	0.1159	0.0271	80	0.0382	0.0017	0.1227	-0.0121
17	0.0080	0.0019	0.1260	0.0363	81	0.0386	0.0017	0.1322	-0.0137
18	0.0085	0.0021	0.1301	0.0377	82	0.0392	0.0016	0.1389	-0.0065
19	0.0091	0.0022	0.1281	0.0235	83	0.0397	0.0016	0.1216	-0.0019
20	0.0095	0.0023	0.1123	0.0391	84	0.0402	0.0016	0.1384	-0.0038
21	0.0100	0.0025	0.1326	0.0435	85	0.0408	0.0016	0.1354	0.0032
22	0.0106	0.0026	0.1381	0.0239	86	0.0413	0.0016	0.1286	-0.0003
23	0.0111	0.0027	0.1129	0.0311	87	0.0418	0.0016	0.1389	0.0004
24	0.0115	0.0029	0.1282	0.0327	88	0.0424	0.0016	0.1311	0.0025
25	0.0121	0.0030	0.1363	0.0141	89	0.0429	0.0016	0.1269	0.0022
26	0.0126	0.0030	0.1271	0.0192	90	0.0434	0.0016	0.1357	0.0070
27	0.0131	0.0031	0.1414	0.0364	91	0.0440	0.0017	0.1210	0.0042
28	0.0137	0.0033	0.1273	0.0356	92	0.0444	0.0017	0.1236	-0.0003
29	0.0141	0.0034	0.1226	0.0205	93	0.0450	0.0017	0.1438	0.0048
30	0.0147	0.0034	0.1268	0.0142	94	0.0455	0.0017	0.1200	0.0067
31	0.0151	0.0035	0.1207	0.0257	95	0.0459	0.0017	0.1191	0.0111
32	0.0157	0.0036	0.1396	0.0192	96	0.0465	0.0018	0.1158	0.0096
33	0.0163	0.0037	0.1363	0.0136	97	0.0469	0.0018	0.1200	0.0120
34	0.0168	0.0038	0.1220	0.0189	98	0.0474	0.0019	0.1289	0.0315
35	0.0172	0.0038	0.1396	0.0047	99	0.0479	0.0021	0.1133	0.0351
36	0.0179	0.0038	0.1438	0.0014	100	0.0483	0.0022	0.1217	0.0206
37	0.0184	0.0038	0.1223	0.0099	101	0.0489	0.0022	0.1117	0.0079
38	0.0189	0.0039	0.1384	0.0050	102	0.0492	0.0022	0.1182	0.0088
39	0.0195	0.0039	0.1363	-0.0029	103	0.0498	0.0023	0.1070	0.0225
40	0.0199	0.0039	0.1260	-0.0011	104	0.0501	0.0024	0.1045	0.0256
41	0.0205	0.0039	0.1283	-0.0032	105	0.0506	0.0025	0.1088	0.0209
42	0.0210	0.0038	0.1187	0.0027	106	0.0510	0.0026	0.1145	0.0284
43	0.0214	0.0039	0.1335	-0.0009	107	0.0516	0.0027	0.1178	0.0346
44	0.0220	0.0038	0.1285	-0.0064	108	0.0519	0.0029	0.1080	0.0333
45	0.0225	0.0038	0.1157	-0.0036	109	0.0524	0.0030	0.1227	0.0283
46	0.0230	0.0038	0.1216	-0.0078	110	0.0529	0.0031	0.1112	0.0312
47	0.0234	0.0038	0.1161	-0.0022	111	0.0533	0.0032	0.1141	0.0319
48	0.0239	0.0038	0.1092	-0.0009	112	0.0538	0.0033	0.1120	0.0190
49	0.0243	0.0038	0.0966	-0.0022	113	0.0542	0.0034	0.1023	0.0110
50	0.0247	0.0038	0.1113	-0.0064	114	0.0546	0.0034	0.1040	0.0239
51	0.0252	0.0037	0.1091	-0.0091	115	0.0550	0.0036	0.1224	0.0337
52	0.0255	0.0037	0.1019	-0.0062	116	0.0556	0.0037	0.1198	0.0293
53	0.0260	0.0037	0.1014	-0.0041	117	0.0560	0.0038	0.1165	0.0192
54	0.0264	0.0036	0.0969	-0.0069	118	0.0565	0.0038	0.1169	0.0091
55	0.0268	0.0036	0.0974	-0.0031	119	0.0569	0.0039	0.1191	-0.0005
56	0.0271	0.0036	0.1037	-0.0051	120	0.0575	0.0038	0.1239	0.0024
57	0.0276	0.0036	0.1041	-0.0072	121	0.0579	0.0039	0.1122	0.0180
58	0.0280	0.0036	0.1014	-0.0067	122	0.0584	0.0040	0.1182	0.0187
59	0.0284	0.0035	0.1067	-0.0161	123	0.0589	0.0041	0.1092	0.0187
60	0.0288	0.0034	0.0964	-0.0266	124	0.0593	0.0041	0.1140	0.0041
61	0.0292	0.0033	0.0984	-0.0277	125	0.0598	0.0041	0.1286	0.0003
62	0.0296	0.0032	0.1004	-0.0185	126	0.0603	0.0041	0.1205	0.0014
63	0.0300	0.0031	0.1064	-0.0103	127	0.0607	0.0041	0.1309	-0.0058
64	0.0305	0.0031	0.1204	-0.0244	128	0.0613	0.0041	0.1210	-0.0011

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0617	0.0041	0.1070	-0.0043	195	0.0914	0.0019	0.0961	0.0505
130	0.0622	0.0041	0.1212	-0.0050	196	0.0918	0.0021	0.1094	0.0541
131	0.0627	0.0041	0.1207	-0.0026	197	0.0923	0.0023	0.1088	0.0507
132	0.0631	0.0040	0.1309	-0.0012	198	0.0927	0.0025	0.0852	0.0461
133	0.0637	0.0040	0.1018	-0.0008	199	0.0930	0.0027	0.0837	0.0258
134	0.0640	0.0040	0.1156	-0.0107	200	0.0933	0.0027	0.0978	0.0313
135	0.0647	0.0040	0.1375	-0.0155	201	0.0938	0.0029	0.1085	0.0468
136	0.0651	0.0039	0.1132	-0.0080	202	0.0942	0.0031	0.1030	0.0472
137	0.0656	0.0039	0.1262	-0.0369	203	0.0946	0.0033	0.1104	0.0356
138	0.0661	0.0036	0.1106	-0.0487	204	0.0951	0.0034	0.1059	0.0224
139	0.0664	0.0035	0.1046	-0.0249	205	0.0955	0.0035	0.1067	0.0243
140	0.0669	0.0034	0.1086	-0.0293	206	0.0959	0.0036	0.1105	0.0318
141	0.0673	0.0033	0.1122	-0.0307	207	0.0963	0.0037	0.1131	0.0367
142	0.0678	0.0032	0.1031	-0.0304	208	0.0969	0.0039	0.1049	0.0320
143	0.0681	0.0030	0.1018	-0.0493	209	0.0972	0.0040	0.1011	0.0206
144	0.0686	0.0028	0.1031	-0.0464	210	0.0977	0.0040	0.1085	0.0199
145	0.0690	0.0027	0.1048	-0.0314	211	0.0981	0.0041	0.1019	0.0111
146	0.0695	0.0025	0.0926	-0.0390	212	0.0985	0.0041	0.1000	0.0084
147	0.0697	0.0023	0.0977	-0.0331	213	0.0989	0.0042	0.1169	0.0095
148	0.0702	0.0023	0.1061	-0.0376	214	0.0994	0.0042	0.1229	0.0025
149	0.0706	0.0020	0.1008	-0.0520	215	0.0998	0.0042	0.1061	-0.0028
150	0.0710	0.0018	0.1080	-0.0521	216	0.1003	0.0042	0.1126	-0.0151
151	0.0714	0.0016	0.1073	-0.0435	217	0.1007	0.0041	0.1072	-0.0081
152	0.0719	0.0015	0.0964	-0.0351	218	0.1011	0.0041	0.1070	-0.0015
153	0.0722	0.0013	0.0934	-0.0417	219	0.1016	0.0041	0.0992	-0.0081
154	0.0727	0.0012	0.1106	-0.0425	220	0.1019	0.0040	0.1048	-0.0152
155	0.0731	0.0010	0.1050	-0.0425	221	0.1024	0.0040	0.0947	-0.0146
156	0.0735	0.0008	0.1018	-0.0394	222	0.1027	0.0039	0.0983	-0.0203
157	0.0739	0.0007	0.1170	-0.0274	223	0.1032	0.0038	0.1158	-0.0367
158	0.0744	0.0006	0.1026	-0.0375	224	0.1036	0.0036	0.1110	-0.0370
159	0.0747	0.0004	0.0944	-0.0429	225	0.1041	0.0035	0.1227	-0.0254
160	0.0752	0.0003	0.1181	-0.0309	226	0.1046	0.0034	0.1109	-0.0233
161	0.0757	0.0001	0.1156	-0.0377	227	0.1050	0.0033	0.0926	-0.0274
162	0.0761	0.0000	0.1293	-0.0336	228	0.1053	0.0032	0.1072	-0.0223
163	0.0767	-0.0001	0.1178	-0.0229	229	0.1058	0.0031	0.1017	-0.0214
164	0.0771	-0.0002	0.1192	-0.0334	230	0.1061	0.0030	0.0894	-0.0350
165	0.0776	-0.0004	0.1288	-0.0292	231	0.1066	0.0029	0.1001	-0.0475
166	0.0781	-0.0005	0.1199	-0.0155	232	0.1069	0.0027	0.1058	-0.0456
167	0.0786	-0.0005	0.1270	-0.0156	233	0.1074	0.0025	0.1032	-0.0338
168	0.0791	-0.0006	0.1258	-0.0086	234	0.1078	0.0024	0.1128	-0.0208
169	0.0796	-0.0006	0.1247	-0.0015	235	0.1083	0.0023	0.1085	-0.0121
170	0.0801	-0.0006	0.1347	-0.0019	236	0.1086	0.0023	0.0975	-0.0115
171	0.0807	-0.0006	0.1342	-0.0012	237	0.1091	0.0022	0.0995	-0.0369
172	0.0812	-0.0006	0.1365	0.0075	238	0.1094	0.0020	0.1005	-0.0467
173	0.0818	-0.0005	0.1209	0.0067	239	0.1099	0.0019	0.1092	-0.0345
174	0.0821	-0.0006	0.1182	0.0056	240	0.1103	0.0017	0.1066	-0.0283
175	0.0827	-0.0005	0.1358	0.0090	241	0.1107	0.0016	0.1085	-0.0219
176	0.0832	-0.0005	0.1190	0.0096	242	0.1112	0.0015	0.1037	-0.0215
177	0.0837	-0.0004	0.1283	0.0082	243	0.1116	0.0015	0.0951	-0.0176
178	0.0842	-0.0004	0.1245	0.0096	244	0.1119	0.0014	0.1088	-0.0330
179	0.0847	-0.0003	0.1113	0.0145	245	0.1124	0.0012	0.1260	-0.0436
180	0.0851	-0.0003	0.1337	0.0110	246	0.1129	0.0011	0.1117	-0.0347
181	0.0857	-0.0003	0.1262	0.0195	247	0.1133	0.0009	0.1005	-0.0284
182	0.0861	-0.0001	0.1216	0.0326	248	0.1137	0.0008	0.1063	-0.0191
183	0.0867	0.0000	0.1096	0.0302	249	0.1142	0.0008	0.1203	-0.0133
184	0.0870	0.0001	0.1023	0.0172	250	0.1147	0.0007	0.1120	-0.0140
185	0.0875	0.0001	0.1046	0.0113	251	0.1151	0.0007	0.1134	-0.0111
186	0.0879	0.0002	0.1041	0.0271	252	0.1156	0.0006	0.1388	-0.0049
187	0.0884	0.0004	0.0916	0.0551	253	0.1162	0.0006	0.1135	0.0000
188	0.0886	0.0006	0.0944	0.0587	254	0.1165	0.0006	0.1141	-0.0002
189	0.0891	0.0008	0.1048	0.0389	255	0.1171	0.0006	0.1155	0.0013
190	0.0894	0.0009	0.1000	0.0262	256	0.1174	0.0006	0.1115	-0.0027
191	0.0899	0.0010	0.1003	0.0474	257	0.1180	0.0006	0.1391	-0.0154
192	0.0902	0.0013	0.0974	0.0633	258	0.1186	0.0005	0.1225	-0.0092
193	0.0907	0.0015	0.0999	0.0480	259	0.1190	0.0005	0.1336	-0.0016
194	0.0910	0.0017	0.0946	0.0391	260	0.1196	0.0005	0.1392	-0.0059

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
261	0.1201	0.0005	0.1269	0.0052	327	0.1478	0.0045	0.1005	-0.0335
262	0.1206	0.0005	0.1359	0.0100	328	0.1482	0.0044	0.1031	-0.0304
263	0.1212	0.0006	0.1123	0.0096	329	0.1486	0.0043	0.1029	-0.0305
264	0.1215	0.0006	0.1215	0.0211	330	0.1490	0.0041	0.1107	-0.0223
265	0.1222	0.0007	0.1274	0.0284	331	0.1495	0.0041	0.1126	-0.0152
266	0.1226	0.0008	0.1159	0.0226	332	0.1499	0.0040	0.1195	-0.0152
267	0.1231	0.0009	0.1285	0.0226	333	0.1504	0.0040	0.1146	-0.0091
268	0.1236	0.0010	0.1114	0.0377	334	0.1508	0.0039	0.1265	-0.0048
269	0.1240	0.0012	0.1137	0.0377	335	0.1515	0.0039	0.1362	-0.0131
270	0.1245	0.0013	0.1014	0.0335	336	0.1519	0.0038	0.1130	-0.0186
271	0.1248	0.0015	0.1074	0.0468	337	0.1524	0.0038	0.1169	-0.0227
272	0.1253	0.0017	0.1075	0.0381	338	0.1529	0.0037	0.1253	-0.0157
273	0.1256	0.0018	0.0992	0.0288	339	0.1534	0.0036	0.1286	-0.0069
274	0.1261	0.0019	0.0929	0.0487	340	0.1539	0.0036	0.1297	-0.0038
275	0.1264	0.0022	0.0963	0.0488	341	0.1544	0.0036	0.1242	0.0016
276	0.1269	0.0023	0.1023	0.0465	342	0.1549	0.0036	0.1327	0.0018
277	0.1272	0.0025	0.0869	0.0489	343	0.1555	0.0036	0.1326	0.0011
278	0.1276	0.0027	0.0904	0.0533	344	0.1560	0.0036	0.1309	0.0024
279	0.1279	0.0030	0.0968	0.0566	345	0.1565	0.0037	0.1421	0.0064
280	0.1284	0.0032	0.1052	0.0517	346	0.1571	0.0037	0.1284	0.0087
281	0.1288	0.0034	0.0900	0.0443	347	0.1575	0.0037	0.1258	0.0073
282	0.1291	0.0035	0.0907	0.0516	348	0.1581	0.0037	0.1306	0.0113
283	0.1295	0.0038	0.0924	0.0553	349	0.1586	0.0038	0.1244	0.0179
284	0.1298	0.0040	0.0984	0.0481	350	0.1591	0.0039	0.1485	0.0127
285	0.1303	0.0042	0.0928	0.0511	351	0.1598	0.0039	0.1309	0.0217
286	0.1306	0.0044	0.0986	0.0485	352	0.1601	0.0041	0.1041	0.0366
287	0.1311	0.0046	0.0983	0.0518	353	0.1606	0.0042	0.1155	0.0324
288	0.1314	0.0048	0.0944	0.0507	354	0.1611	0.0043	0.1191	0.0347
289	0.1318	0.0050	0.0916	0.0347	355	0.1616	0.0045	0.1357	0.0410
290	0.1321	0.0051	0.0815	0.0264	356	0.1622	0.0046	0.1165	0.0361
291	0.1325	0.0052	0.1017	0.0370	357	0.1625	0.0048	0.1067	0.0434
292	0.1329	0.0054	0.1119	0.0391	358	0.1630	0.0050	0.1082	0.0434
293	0.1334	0.0055	0.1013	0.0296	359	0.1634	0.0051	0.0980	0.0406
294	0.1337	0.0056	0.0999	0.0316	360	0.1638	0.0053	0.1009	0.0519
295	0.1342	0.0058	0.1057	0.0295	361	0.1642	0.0055	0.1034	0.0522
296	0.1346	0.0058	0.1137	0.0148	362	0.1646	0.0057	0.1029	0.0447
297	0.1351	0.0059	0.1073	0.0106	363	0.1650	0.0059	0.0953	0.0498
298	0.1354	0.0059	0.0997	0.0142	364	0.1654	0.0061	0.0906	0.0617
299	0.1359	0.0060	0.1061	0.0207	365	0.1657	0.0064	0.1001	0.0629
300	0.1363	0.0061	0.1036	0.0198	366	0.1662	0.0066	0.1022	0.0534
301	0.1367	0.0061	0.0949	0.0056	367	0.1665	0.0068	0.1050	0.0538
302	0.1370	0.0061	0.1011	0.0049	368	0.1670	0.0071	0.0984	0.0619
303	0.1375	0.0062	0.1107	0.0042	369	0.1673	0.0073	0.0981	0.0548
304	0.1379	0.0062	0.1114	0.0009	370	0.1678	0.0075	0.1017	0.0507
305	0.1384	0.0062	0.1158	-0.0034	371	0.1681	0.0077	0.1013	0.0650
306	0.1388	0.0061	0.1062	-0.0071	372	0.1686	0.0080	0.1036	0.0690
307	0.1393	0.0061	0.0890	-0.0062	373	0.1690	0.0083	0.1029	0.0462
308	0.1396	0.0061	0.0942	-0.0080	374	0.1694	0.0084	0.1160	0.0413
309	0.1400	0.0061	0.1096	-0.0032	375	0.1699	0.0086	0.1175	0.0572
310	0.1404	0.0061	0.1167	-0.0128	376	0.1704	0.0088	0.1002	0.0585
311	0.1409	0.0060	0.1235	-0.0253	377	0.1707	0.0091	0.1053	0.0417
312	0.1414	0.0059	0.1139	-0.0264	378	0.1712	0.0092	0.1048	0.0234
313	0.1419	0.0058	0.1125	-0.0214	379	0.1715	0.0093	0.1041	0.0451
314	0.1423	0.0057	0.1068	-0.0187	380	0.1721	0.0095	0.1017	0.0539
315	0.1427	0.0056	0.1047	-0.0112	381	0.1723	0.0097	0.1061	0.0413
316	0.1432	0.0056	0.0954	-0.0100	382	0.1729	0.0099	0.1161	0.0354
317	0.1435	0.0055	0.0999	-0.0279	383	0.1733	0.0100	0.1040	0.0182
318	0.1440	0.0054	0.1116	-0.0289	384	0.1737	0.0100	0.1123	0.0219
319	0.1444	0.0053	0.1097	-0.0247	385	0.1742	0.0101	0.1160	0.0289
320	0.1448	0.0052	0.1133	-0.0284	386	0.1747	0.0103	0.1231	0.0260
321	0.1453	0.0051	0.1134	-0.0271	387	0.1751	0.0104	0.1077	0.0156
322	0.1457	0.0050	0.1068	-0.0238	388	0.1755	0.0104	0.1125	0.0110
323	0.1461	0.0049	0.1108	-0.0175	389	0.1760	0.0104	0.1041	0.0112
324	0.1466	0.0048	0.1038	-0.0177	390	0.1764	0.0105	0.1028	0.0140
325	0.1470	0.0047	0.0964	-0.0214	391	0.1769	0.0106	0.1069	0.0148
326	0.1474	0.0047	0.1022	-0.0287	392	0.1772	0.0106	-	-

Table B2.6 Raw data of free-rising WD-5.915-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0365	-0.0021	0.1227	-0.0408
2	0.0007	0.0001	0.1619	0.0243	66	0.0370	-0.0023	0.1346	-0.0413
3	0.0013	0.0002	0.1363	0.0298	67	0.0376	-0.0024	0.1399	-0.0343
4	0.0018	0.0003	0.1398	0.0304	68	0.0381	-0.0025	0.1272	-0.0248
5	0.0024	0.0004	0.1646	0.0304	69	0.0386	-0.0026	0.1432	-0.0255
6	0.0031	0.0006	0.1431	0.0288	70	0.0393	-0.0027	0.1518	-0.0347
7	0.0036	0.0007	0.1407	0.0343	71	0.0398	-0.0029	0.1445	-0.0340
8	0.0042	0.0008	0.1647	0.0292	72	0.0404	-0.0030	0.1422	-0.0268
9	0.0049	0.0009	0.1702	0.0145	73	0.0410	-0.0031	0.1384	-0.0298
10	0.0056	0.0009	0.1456	0.0205	74	0.0415	-0.0032	0.1358	-0.0300
11	0.0060	0.0011	0.1451	0.0398	75	0.0421	-0.0034	0.1438	-0.0230
12	0.0067	0.0013	0.1627	0.0347	76	0.0427	-0.0034	0.1556	-0.0200
13	0.0073	0.0013	0.1614	0.0148	77	0.0433	-0.0035	0.1446	-0.0291
14	0.0080	0.0014	0.1529	0.0198	78	0.0438	-0.0037	0.1397	-0.0320
15	0.0086	0.0015	0.1447	0.0363	79	0.0444	-0.0038	0.1503	-0.0246
16	0.0092	0.0017	0.1574	0.0253	80	0.0450	-0.0039	0.1501	-0.0186
17	0.0098	0.0017	0.1699	0.0076	81	0.0456	-0.0039	0.1523	-0.0212
18	0.0105	0.0017	0.1611	0.0134	82	0.0463	-0.0040	0.1489	-0.0232
19	0.0111	0.0018	0.1464	0.0095	83	0.0468	-0.0041	0.1521	-0.0203
20	0.0117	0.0018	0.1476	0.0064	84	0.0475	-0.0042	0.1508	-0.0165
21	0.0123	0.0019	0.1582	0.0193	85	0.0480	-0.0042	0.1493	-0.0115
22	0.0130	0.0020	0.1550	0.0222	86	0.0487	-0.0043	0.1581	-0.0068
23	0.0135	0.0020	0.1431	0.0134	87	0.0493	-0.0043	0.1534	-0.0190
24	0.0141	0.0021	0.1578	0.0094	88	0.0499	-0.0044	0.1549	-0.0250
25	0.0148	0.0021	0.1661	0.0049	89	0.0505	-0.0045	0.1609	-0.0125
26	0.0154	0.0021	0.1509	0.0009	90	0.0512	-0.0045	0.1552	-0.0099
27	0.0160	0.0021	0.1445	-0.0027	91	0.0518	-0.0046	0.1572	-0.0058
28	0.0166	0.0021	0.1524	-0.0051	92	0.0525	-0.0046	0.1637	-0.0036
29	0.0172	0.0021	0.1481	0.0005	93	0.0531	-0.0046	0.1581	0.0006
30	0.0178	0.0021	0.1469	-0.0021	94	0.0537	-0.0046	0.1587	0.0003
31	0.0184	0.0021	0.1433	-0.0085	95	0.0543	-0.0046	0.1518	-0.0013
32	0.0189	0.0020	0.1413	-0.0110	96	0.0549	-0.0046	0.1666	-0.0008
33	0.0195	0.0020	0.1459	-0.0097	97	0.0557	-0.0046	0.1721	0.0011
34	0.0201	0.0019	0.1380	-0.0097	98	0.0563	-0.0046	0.1633	0.0078
35	0.0206	0.0019	0.1511	-0.0141	99	0.0570	-0.0045	0.1559	0.0043
36	0.0213	0.0018	0.1581	-0.0281	100	0.0576	-0.0045	0.1476	-0.0001
37	0.0219	0.0017	0.1310	-0.0323	101	0.0582	-0.0045	0.1611	0.0012
38	0.0224	0.0016	0.1261	-0.0225	102	0.0588	-0.0045	0.1659	0.0045
39	0.0229	0.0015	0.1397	-0.0221	103	0.0595	-0.0045	0.1658	0.0085
40	0.0235	0.0014	0.1351	-0.0334	104	0.0602	-0.0045	0.1545	0.0042
41	0.0240	0.0012	0.1402	-0.0339	105	0.0607	-0.0045	0.1504	0.0045
42	0.0246	0.0011	0.1441	-0.0269	106	0.0614	-0.0044	0.1580	0.0070
43	0.0251	0.0010	0.1274	-0.0322	107	0.0620	-0.0044	0.1586	0.0093
44	0.0256	0.0009	0.1312	-0.0341	108	0.0626	-0.0044	0.1545	0.0085
45	0.0262	0.0007	0.1320	-0.0274	109	0.0632	-0.0044	0.1496	0.0077
46	0.0267	0.0006	0.1157	-0.0252	110	0.0638	-0.0043	0.1429	0.0165
47	0.0271	0.0005	0.1212	-0.0378	111	0.0644	-0.0042	0.1473	0.0281
48	0.0276	0.0003	0.1254	-0.0408	112	0.0650	-0.0041	0.1535	0.0269
49	0.0281	0.0002	0.1253	-0.0280	113	0.0656	-0.0040	0.1522	0.0187
50	0.0286	0.0001	0.1356	-0.0298	114	0.0662	-0.0039	0.1593	0.0132
51	0.0292	0.0000	0.1322	-0.0353	115	0.0669	-0.0039	0.1486	0.0147
52	0.0297	-0.0002	0.1278	-0.0338	116	0.0674	-0.0038	0.1434	0.0309
53	0.0302	-0.0003	0.1303	-0.0365	117	0.0680	-0.0037	0.1546	0.0401
54	0.0307	-0.0005	0.1278	-0.0422	118	0.0687	-0.0035	0.1454	0.0362
55	0.0312	-0.0006	0.1309	-0.0438	119	0.0692	-0.0034	0.1344	0.0305
56	0.0318	-0.0008	0.1239	-0.0354	120	0.0697	-0.0032	0.1424	0.0358
57	0.0322	-0.0009	0.1275	-0.0324	121	0.0703	-0.0031	0.1399	0.0285
58	0.0328	-0.0011	0.1291	-0.0407	122	0.0709	-0.0030	0.1412	0.0378
59	0.0333	-0.0012	0.1245	-0.0432	123	0.0715	-0.0028	0.1314	0.0503
60	0.0338	-0.0014	0.1381	-0.0318	124	0.0719	-0.0026	0.1427	0.0402
61	0.0344	-0.0015	0.1384	-0.0335	125	0.0726	-0.0025	0.1680	0.0442
62	0.0349	-0.0017	0.1368	-0.0393	126	0.0732	-0.0023	0.1311	0.0469
63	0.0355	-0.0018	0.1395	-0.0320	127	0.0736	-0.0021	0.1232	0.0437
64	0.0360	-0.0019	0.1322	-0.0354	128	0.0742	-0.0019	0.1303	0.0465

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0747	-0.0017	0.1329	0.0514	195	0.1124	0.0064	0.1433	-0.0328
130	0.0753	-0.0015	0.1372	0.0445	196	0.1130	0.0062	0.1379	-0.0397
131	0.0758	-0.0013	0.1390	0.0535	197	0.1135	0.0060	0.1478	-0.0415
132	0.0764	-0.0011	0.1330	0.0608	198	0.1142	0.0059	0.1469	-0.0426
133	0.0768	-0.0009	0.1310	0.0463	199	0.1147	0.0057	0.1266	-0.0413
134	0.0775	-0.0007	0.1343	0.0488	200	0.1152	0.0055	0.1373	-0.0402
135	0.0779	-0.0005	0.1176	0.0631	201	0.1158	0.0054	0.1405	-0.0392
136	0.0784	-0.0002	0.1397	0.0585	202	0.1163	0.0052	0.1298	-0.0432
137	0.0790	0.0000	0.1346	0.0548	203	0.1168	0.0050	0.1427	-0.0478
138	0.0795	0.0002	0.1327	0.0684	204	0.1174	0.0048	0.1448	-0.0455
139	0.0801	0.0005	0.1433	0.0547	205	0.1180	0.0047	0.1293	-0.0529
140	0.0806	0.0007	0.1378	0.0528	206	0.1185	0.0044	0.1366	-0.0546
141	0.0812	0.0010	0.1349	0.0608	207	0.1191	0.0042	0.1400	-0.0451
142	0.0817	0.0012	0.1384	0.0525	208	0.1196	0.0041	0.1295	-0.0451
143	0.0823	0.0014	0.1366	0.0547	209	0.1201	0.0039	0.1324	-0.0521
144	0.0828	0.0016	0.1260	0.0582	210	0.1206	0.0036	0.1306	-0.0526
145	0.0833	0.0019	0.1388	0.0637	211	0.1212	0.0034	0.1325	-0.0507
146	0.0839	0.0021	0.1346	0.0617	212	0.1217	0.0032	0.1405	-0.0485
147	0.0844	0.0023	0.1397	0.0608	213	0.1223	0.0031	0.1334	-0.0399
148	0.0850	0.0026	0.1388	0.0627	214	0.1228	0.0029	0.1309	-0.0476
149	0.0855	0.0028	0.1321	0.0545	215	0.1233	0.0027	0.1327	-0.0478
150	0.0861	0.0030	0.1387	0.0497	216	0.1238	0.0025	0.1280	-0.0406
151	0.0866	0.0032	0.1255	0.0588	217	0.1243	0.0024	0.1308	-0.0447
152	0.0871	0.0035	0.1278	0.0619	218	0.1249	0.0022	0.1388	-0.0513
153	0.0876	0.0037	0.1378	0.0557	219	0.1255	0.0019	0.1265	-0.0553
154	0.0882	0.0040	0.1474	0.0586	220	0.1259	0.0017	0.1240	-0.0477
155	0.0888	0.0042	0.1406	0.0563	221	0.1264	0.0016	0.1290	-0.0469
156	0.0893	0.0044	0.1406	0.0593	222	0.1269	0.0014	0.1342	-0.0509
157	0.0899	0.0047	0.1464	0.0519	223	0.1275	0.0012	0.1370	-0.0449
158	0.0905	0.0048	0.1476	0.0500	224	0.1280	0.0010	0.1353	-0.0507
159	0.0911	0.0051	0.1467	0.0540	225	0.1286	0.0008	0.1352	-0.0540
160	0.0917	0.0053	0.1407	0.0507	226	0.1291	0.0006	0.1310	-0.0486
161	0.0923	0.0055	0.1417	0.0520	227	0.1297	0.0004	0.1337	-0.0475
162	0.0928	0.0057	0.1442	0.0462	228	0.1302	0.0002	0.1376	-0.0520
163	0.0934	0.0059	0.1421	0.0469	229	0.1308	-0.0001	0.1405	-0.0473
164	0.0939	0.0060	0.1420	0.0433	230	0.1313	-0.0002	0.1364	-0.0362
165	0.0945	0.0062	0.1462	0.0427	231	0.1318	-0.0003	0.1387	-0.0444
166	0.0951	0.0064	0.1478	0.0426	232	0.1324	-0.0006	0.1371	-0.0445
167	0.0957	0.0065	0.1617	0.0378	233	0.1329	-0.0007	0.1395	-0.0417
168	0.0964	0.0067	0.1482	0.0334	234	0.1335	-0.0009	0.1483	-0.0387
169	0.0969	0.0068	0.1429	0.0307	235	0.1341	-0.0010	0.1477	-0.0369
170	0.0975	0.0069	0.1594	0.0272	236	0.1347	-0.0012	0.1456	-0.0461
171	0.0982	0.0070	0.1583	0.0245	237	0.1353	-0.0014	0.1357	-0.0418
172	0.0988	0.0071	0.1510	0.0226	238	0.1358	-0.0015	0.1359	-0.0410
173	0.0994	0.0072	0.1452	0.0210	239	0.1364	-0.0017	0.1541	-0.0374
174	0.1000	0.0073	0.1495	0.0201	240	0.1370	-0.0018	0.1483	-0.0295
175	0.1006	0.0074	0.1538	0.0129	241	0.1376	-0.0019	0.1526	-0.0384
176	0.1012	0.0074	0.1532	0.0085	242	0.1382	-0.0021	0.1537	-0.0418
177	0.1018	0.0074	0.1478	0.0046	243	0.1388	-0.0023	0.1419	-0.0389
178	0.1024	0.0074	0.1537	-0.0007	244	0.1394	-0.0024	0.1399	-0.0328
179	0.1030	0.0074	0.1597	-0.0041	245	0.1399	-0.0025	0.1531	-0.0207
180	0.1037	0.0074	0.1469	-0.0023	246	0.1406	-0.0026	0.1524	-0.0290
181	0.1042	0.0074	0.1441	-0.0043	247	0.1411	-0.0028	0.1512	-0.0390
182	0.1048	0.0074	0.1486	-0.0087	248	0.1418	-0.0029	0.1534	-0.0295
183	0.1054	0.0073	0.1516	-0.0092	249	0.1424	-0.0030	0.1435	-0.0212
184	0.1060	0.0073	0.1540	-0.0066	250	0.1430	-0.0031	0.1605	-0.0255
185	0.1066	0.0073	0.1389	-0.0039	251	0.1436	-0.0032	0.1637	-0.0273
186	0.1071	0.0073	0.1360	-0.0157	252	0.1443	-0.0033	0.1519	-0.0169
187	0.1077	0.0072	0.1532	-0.0088	253	0.1449	-0.0033	0.1587	-0.0167
188	0.1084	0.0072	0.1476	-0.0095	254	0.1455	-0.0034	0.1635	-0.0198
189	0.1089	0.0071	0.1442	-0.0315	255	0.1462	-0.0035	0.1612	-0.0190
190	0.1095	0.0069	0.1464	-0.0443	256	0.1468	-0.0036	0.1669	-0.0234
191	0.1101	0.0067	0.1499	-0.0304	257	0.1475	-0.0037	0.1540	-0.0174
192	0.1107	0.0067	0.1455	-0.0241	258	0.1481	-0.0037	0.1655	-0.0069
193	0.1112	0.0065	0.1395	-0.0310	259	0.1488	-0.0037	0.1777	-0.0035
194	0.1118	0.0065	0.1452	-0.0233	260	0.1495	-0.0038	0.1623	-0.0050

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
261	0.1501	-0.0038	0.1637	-0.0016	327	0.1859	0.0088	0.1245	0.0539
262	0.1508	-0.0038	0.1555	0.0044	328	0.1865	0.0090	0.1350	0.0470
263	0.1514	-0.0037	0.1616	0.0055	329	0.1870	0.0092	0.1393	0.0442
264	0.1521	-0.0037	0.1725	0.0030	330	0.1876	0.0093	0.1376	0.0471
265	0.1528	-0.0037	0.1653	0.0074	331	0.1881	0.0095	0.1350	0.0439
266	0.1534	-0.0037	0.1646	0.0090	332	0.1887	0.0097	0.1434	0.0373
267	0.1541	-0.0037	0.1579	0.0064	333	0.1893	0.0098	0.1431	0.0383
268	0.1547	-0.0036	0.1585	0.0091	334	0.1898	0.0100	0.1289	0.0390
269	0.1553	-0.0036	0.1697	0.0050	335	0.1903	0.0101	0.1372	0.0372
270	0.1560	-0.0036	0.1675	0.0119	336	0.1909	0.0103	0.1414	0.0290
271	0.1567	-0.0035	0.1683	0.0192	337	0.1914	0.0104	0.1321	0.0275
272	0.1574	-0.0034	0.1635	0.0250	338	0.1920	0.0105	0.1483	0.0302
273	0.1580	-0.0033	0.1504	0.0324	339	0.1926	0.0106	0.1579	0.0299
274	0.1586	-0.0032	0.1535	0.0195	340	0.1932	0.0107	0.1420	0.0222
275	0.1592	-0.0031	0.1621	0.0116	341	0.1937	0.0108	0.1431	0.0171
276	0.1599	-0.0031	0.1686	0.0178	342	0.1944	0.0109	0.1527	0.0266
277	0.1606	-0.0030	0.1573	0.0350	343	0.1950	0.0110	0.1485	0.0286
278	0.1611	-0.0028	0.1533	0.0454	344	0.1956	0.0111	0.1441	0.0205
279	0.1618	-0.0026	0.1546	0.0445	345	0.1961	0.0112	0.1451	0.0089
280	0.1624	-0.0024	0.1564	0.0431	346	0.1967	0.0112	0.1586	0.0032
281	0.1630	-0.0023	0.1490	0.0363	347	0.1974	0.0112	0.1587	0.0032
282	0.1636	-0.0021	0.1389	0.0443	348	0.1980	0.0112	0.1474	0.0053
283	0.1641	-0.0019	0.1550	0.0492	349	0.1986	0.0112	0.1516	0.0134
284	0.1648	-0.0017	0.1525	0.0494	350	0.1992	0.0113	0.1591	0.0161
285	0.1654	-0.0015	0.1372	0.0479	351	0.1998	0.0114	0.1729	0.0114
286	0.1659	-0.0014	0.1436	0.0532	352	0.2006	0.0114	0.1602	0.0042
287	0.1665	-0.0011	0.1501	0.0616	353	0.2011	0.0114	0.1472	0.0013
288	0.1671	-0.0009	0.1320	0.0541	354	0.2018	0.0114	0.1588	0.0032
289	0.1676	-0.0007	0.1443	0.0509	355	0.2024	0.0114	0.1634	-0.0008
290	0.1683	-0.0005	0.1502	0.0581	356	0.2031	0.0114	0.1567	-0.0027
291	0.1688	-0.0002	0.1180	0.0576	357	0.2036	0.0114	0.1503	-0.0027
292	0.1692	0.0000	0.1309	0.0500	358	0.2043	0.0114	0.1560	-0.0057
293	0.1698	0.0002	0.1436	0.0581	359	0.2049	0.0114	0.1681	-0.0041
294	0.1703	0.0005	0.1176	0.0672	360	0.2056	0.0114	0.1590	-0.0029
295	0.1708	0.0007	0.1275	0.0592	361	0.2062	0.0113	0.1495	-0.0088
296	0.1714	0.0009	0.1359	0.0569	362	0.2068	0.0113	0.1659	-0.0056
297	0.1719	0.0012	0.1139	0.0715	363	0.2075	0.0113	0.1704	-0.0077
298	0.1723	0.0015	0.1291	0.0664	364	0.2082	0.0112	0.1678	-0.0203
299	0.1729	0.0017	0.1320	0.0566	365	0.2088	0.0111	0.1543	-0.0217
300	0.1733	0.0020	0.1224	0.0648	366	0.2094	0.0110	0.1564	-0.0208
301	0.1739	0.0022	0.1289	0.0708	367	0.2101	0.0110	0.1682	-0.0189
302	0.1744	0.0025	0.1214	0.0629	368	0.2107	0.0109	0.1601	-0.0176
303	0.1748	0.0027	0.1010	0.0677	369	0.2114	0.0108	0.1656	-0.0128
304	0.1752	0.0031	0.1098	0.0800	370	0.2121	0.0108	0.1753	-0.0197
305	0.1757	0.0034	0.1253	0.0610	371	0.2128	0.0107	0.1560	-0.0273
306	0.1762	0.0036	0.1190	0.0600	372	0.2133	0.0106	0.1543	-0.0149
307	0.1767	0.0039	0.1213	0.0709	373	0.2140	0.0105	0.1623	-0.0130
308	0.1771	0.0041	0.1095	0.0632	374	0.2146	0.0105	0.1657	-0.0213
309	0.1775	0.0044	0.1172	0.0672	375	0.2153	0.0104	0.1765	-0.0309
310	0.1781	0.0047	0.1183	0.0694	376	0.2160	0.0102	0.1621	-0.0255
311	0.1785	0.0049	0.1005	0.0605	377	0.2166	0.0102	0.1609	-0.0157
312	0.1789	0.0051	0.1130	0.0689	378	0.2173	0.0101	0.1656	-0.0215
313	0.1794	0.0055	0.1123	0.0716	379	0.2179	0.0100	0.1645	-0.0275
314	0.1798	0.0057	0.0988	0.0657	380	0.2186	0.0099	0.1687	-0.0219
315	0.1802	0.0060	0.1023	0.0678	381	0.2193	0.0098	0.1592	-0.0146
316	0.1806	0.0063	0.1156	0.0595	382	0.2199	0.0098	0.1550	-0.0093
317	0.1811	0.0065	0.1247	0.0518	383	0.2205	0.0098	0.1563	-0.0100
318	0.1816	0.0067	0.1203	0.0569	384	0.2212	0.0097	0.1653	-0.0114
319	0.1821	0.0069	0.1145	0.0625	385	0.2219	0.0097	0.1678	-0.0043
320	0.1825	0.0072	0.1210	0.0639	386	0.2225	0.0096	0.1622	-0.0067
321	0.1830	0.0074	0.1174	0.0644	387	0.2232	0.0096	0.1628	-0.0070
322	0.1835	0.0077	0.1142	0.0606	388	0.2238	0.0096	0.1567	-0.0049
323	0.1840	0.0079	0.1296	0.0539	389	0.2244	0.0096	0.1641	-0.0181
324	0.1845	0.0081	0.1220	0.0468	390	0.2251	0.0094	0.1705	-0.0234
325	0.1849	0.0083	0.1214	0.0531	391	0.2258	0.0094	0.1585	-0.0131
326	0.1855	0.0085	0.1250	0.0606	392	0.2264	0.0093	-	-

Table B2.7 Raw data of free-rising EPS-2.369-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0386	-0.0027	0.1748	-0.0003
2	0.0007	0.0001	0.1379	0.0396	66	0.0392	-0.0026	0.1791	0.0252
3	0.0011	0.0003	0.1208	0.0730	67	0.0400	-0.0025	0.1925	0.0260
4	0.0017	0.0007	0.1551	0.0644	68	0.0408	-0.0024	0.1599	0.0335
5	0.0023	0.0008	0.1676	0.0250	69	0.0413	-0.0022	0.1270	0.0480
6	0.0030	0.0009	0.1572	0.0219	70	0.0418	-0.0020	0.1341	0.0567
7	0.0036	0.0010	0.1441	0.0216	71	0.0424	-0.0018	0.1135	0.0800
8	0.0042	0.0010	0.1687	0.0055	72	0.0427	-0.0014	0.1032	0.0928
9	0.0050	0.0011	0.1943	0.0024	73	0.0432	-0.0010	0.1315	0.0619
10	0.0057	0.0011	0.1930	0.0033	74	0.0438	-0.0009	0.1560	0.0294
11	0.0065	0.0011	0.1180	-0.0130	75	0.0444	-0.0008	0.1553	0.0379
12	0.0067	0.0010	0.0726	-0.0232	76	0.0450	-0.0006	0.1552	0.0400
13	0.0071	0.0009	0.1306	-0.0327	77	0.0457	-0.0005	0.1733	0.0297
14	0.0077	0.0007	0.1691	-0.0809	78	0.0464	-0.0004	0.1721	0.0222
15	0.0084	0.0002	0.1650	-0.0699	79	0.0471	-0.0003	0.1755	0.0062
16	0.0090	0.0001	0.1177	-0.0427	80	0.0478	-0.0003	0.1902	-0.0092
17	0.0094	-0.0001	0.1244	-0.0836	81	0.0486	-0.0004	0.1949	-0.0162
18	0.0100	-0.0005	0.1400	-0.0702	82	0.0494	-0.0004	0.1975	-0.0156
19	0.0105	-0.0007	0.1270	-0.0388	83	0.0502	-0.0005	0.1708	-0.0236
20	0.0111	-0.0008	0.1363	-0.0462	84	0.0507	-0.0006	0.1465	-0.0322
21	0.0116	-0.0010	0.1281	-0.0668	85	0.0513	-0.0008	0.1619	-0.0517
22	0.0121	-0.0014	0.1380	-0.0602	86	0.0520	-0.0010	0.1535	-0.0698
23	0.0127	-0.0015	0.1637	-0.0314	87	0.0526	-0.0013	0.1154	-0.0716
24	0.0134	-0.0016	0.1667	-0.0330	88	0.0529	-0.0016	0.1302	-0.0573
25	0.0140	-0.0018	0.1527	-0.0397	89	0.0536	-0.0018	0.1443	-0.0619
26	0.0146	-0.0020	0.1642	-0.0270	90	0.0541	-0.0021	0.1238	-0.0664
27	0.0153	-0.0020	0.1897	-0.0068	91	0.0546	-0.0023	0.1423	-0.0515
28	0.0161	-0.0020	0.1787	0.0112	92	0.0552	-0.0025	0.1688	-0.0681
29	0.0168	-0.0019	0.1621	0.0235	93	0.0559	-0.0029	0.1603	-0.0810
30	0.0174	-0.0018	0.1764	0.0105	94	0.0565	-0.0032	0.1418	-0.0645
31	0.0182	-0.0018	0.1504	0.0322	95	0.0571	-0.0034	0.1673	-0.0407
32	0.0186	-0.0016	0.1265	0.0463	96	0.0579	-0.0035	0.2037	-0.0103
33	0.0192	-0.0014	0.1358	0.0498	97	0.0587	-0.0035	0.1985	-0.0057
34	0.0197	-0.0012	0.1287	0.0685	98	0.0594	-0.0035	0.1971	-0.0089
35	0.0202	-0.0009	0.1303	0.0543	99	0.0603	-0.0035	0.1990	0.0017
36	0.0208	-0.0007	0.1334	0.0522	100	0.0610	-0.0035	0.1903	0.0141
37	0.0213	-0.0005	0.1270	0.0626	101	0.0618	-0.0034	0.1722	0.0238
38	0.0218	-0.0002	0.1252	0.0896	102	0.0624	-0.0033	0.1465	0.0232
39	0.0223	0.0002	0.1507	0.0657	103	0.0630	-0.0032	0.1269	0.0287
40	0.0230	0.0003	0.1599	0.0258	104	0.0634	-0.0031	0.1290	0.0542
41	0.0236	0.0004	0.1615	0.0332	105	0.0640	-0.0028	0.1418	0.0645
42	0.0243	0.0006	0.1470	0.0309	106	0.0646	-0.0026	0.1470	0.0449
43	0.0247	0.0007	0.1494	0.0150	107	0.0652	-0.0024	0.1496	0.0413
44	0.0255	0.0007	0.1882	-0.0034	108	0.0658	-0.0023	0.1631	0.0329
45	0.0262	0.0007	0.1834	-0.0031	109	0.0665	-0.0022	0.1702	0.0438
46	0.0269	0.0007	0.1650	0.0043	110	0.0671	-0.0019	0.1593	0.0454
47	0.0276	0.0007	0.1617	-0.0105	111	0.0678	-0.0018	0.1290	0.0258
48	0.0282	0.0006	0.1584	-0.0518	112	0.0682	-0.0017	0.1460	0.0253
49	0.0288	0.0003	0.1671	-0.0734	113	0.0689	-0.0016	0.1728	0.0413
50	0.0296	0.0000	0.1485	-0.0654	114	0.0695	-0.0014	0.1742	0.0344
51	0.0300	-0.0002	0.1202	-0.0621	115	0.0703	-0.0013	0.1926	0.0064
52	0.0305	-0.0005	0.1356	-0.0713	116	0.0711	-0.0013	0.1924	-0.0010
53	0.0311	-0.0008	0.1221	-0.0653	117	0.0719	-0.0013	0.2050	0.0017
54	0.0315	-0.0010	0.1123	-0.0628	118	0.0727	-0.0013	0.2028	0.0015
55	0.0320	-0.0013	0.1370	-0.0680	119	0.0735	-0.0013	0.1867	-0.0221
56	0.0326	-0.0016	0.1376	-0.0531	120	0.0742	-0.0015	0.1409	-0.0208
57	0.0331	-0.0017	0.1440	-0.0464	121	0.0746	-0.0015	0.1455	-0.0123
58	0.0337	-0.0019	0.1620	-0.0577	122	0.0754	-0.0016	0.1547	-0.0258
59	0.0344	-0.0022	0.1519	-0.0521	123	0.0758	-0.0017	0.1188	-0.0691
60	0.0350	-0.0024	0.1518	-0.0453	124	0.0763	-0.0021	0.1256	-0.0737
61	0.0356	-0.0026	0.1711	-0.0310	125	0.0769	-0.0023	0.1238	-0.0567
62	0.0363	-0.0026	0.1857	-0.0042	126	0.0773	-0.0026	0.1272	-0.1043
63	0.0371	-0.0026	0.1895	-0.0016	127	0.0779	-0.0031	0.1341	-0.0877
64	0.0378	-0.0026	0.1843	-0.0142	128	0.0784	-0.0033	0.1522	-0.0335

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0791	-0.0034	0.1728	-0.0155	195	0.1211	-0.0034	0.1397	-0.0630
130	0.0798	-0.0034	0.1765	-0.0144	196	0.1216	-0.0036	0.1472	-0.0690
131	0.0805	-0.0035	0.1470	-0.0464	197	0.1222	-0.0040	0.1349	-0.0616
132	0.0809	-0.0038	0.1446	-0.0415	198	0.1227	-0.0041	0.1212	-0.0335
133	0.0817	-0.0038	0.1907	-0.0154	199	0.1232	-0.0042	0.1418	-0.0413
134	0.0825	-0.0039	0.1990	-0.0093	200	0.1238	-0.0044	0.1428	-0.0560
135	0.0832	-0.0039	0.2008	0.0047	201	0.1243	-0.0047	0.1364	-0.0576
136	0.0841	-0.0039	0.1828	0.0141	202	0.1249	-0.0049	0.1480	-0.0676
137	0.0847	-0.0038	0.1550	0.0092	203	0.1255	-0.0052	0.1647	-0.0579
138	0.0853	-0.0038	0.1656	0.0133	204	0.1262	-0.0054	0.1692	-0.0445
139	0.0860	-0.0037	0.1654	0.0169	205	0.1269	-0.0056	0.1631	-0.0515
140	0.0866	-0.0037	0.1451	0.0249	206	0.1275	-0.0058	0.1809	-0.0149
141	0.0872	-0.0035	0.1643	0.0370	207	0.1283	-0.0057	0.1972	0.0077
142	0.0880	-0.0034	0.1444	0.0413	208	0.1291	-0.0057	0.2012	-0.0042
143	0.0884	-0.0032	0.1117	0.0791	209	0.1299	-0.0057	0.1942	0.0080
144	0.0888	-0.0027	0.1367	0.0954	210	0.1307	-0.0057	0.1631	0.0319
145	0.0894	-0.0024	0.1290	0.0851	211	0.1312	-0.0055	0.1477	0.0404
146	0.0899	-0.0021	0.1251	0.0711	212	0.1318	-0.0053	0.1425	0.0418
147	0.0904	-0.0018	0.1441	0.0649	213	0.1324	-0.0051	0.1344	0.0230
148	0.0910	-0.0015	0.1501	0.0548	214	0.1329	-0.0052	0.1268	0.0336
149	0.0916	-0.0014	0.1630	0.0411	215	0.1334	-0.0049	0.1106	0.0699
150	0.0923	-0.0012	0.1707	0.0320	216	0.1338	-0.0046	0.1263	0.0563
151	0.0930	-0.0011	0.1927	0.0085	217	0.1344	-0.0044	0.1314	0.0506
152	0.0939	-0.0011	0.1975	-0.0007	218	0.1349	-0.0042	0.1433	0.0478
153	0.0946	-0.0011	0.1755	-0.0090	219	0.1356	-0.0040	0.1826	0.0575
154	0.0953	-0.0012	0.1815	-0.0120	220	0.1363	-0.0037	0.1831	0.0448
155	0.0960	-0.0012	0.1842	-0.0148	221	0.1370	-0.0037	0.1574	0.0364
156	0.0968	-0.0013	0.1769	-0.0275	222	0.1376	-0.0034	0.1682	0.0461
157	0.0975	-0.0015	0.1542	-0.0601	223	0.1384	-0.0033	0.1857	0.0305
158	0.0980	-0.0018	0.1407	-0.0739	224	0.1391	-0.0032	0.1709	0.0334
159	0.0986	-0.0021	0.1499	-0.0535	225	0.1397	-0.0030	0.1720	0.0235
160	0.0992	-0.0022	0.1388	-0.0639	226	0.1404	-0.0030	0.1885	-0.0031
161	0.0997	-0.0026	0.1298	-0.0788	227	0.1412	-0.0031	0.1968	-0.0176
162	0.1002	-0.0029	0.1337	-0.0570	228	0.1420	-0.0031	0.1803	-0.0399
163	0.1008	-0.0030	0.1431	-0.0838	229	0.1427	-0.0034	0.1498	-0.0738
164	0.1014	-0.0035	0.1584	-0.1138	230	0.1432	-0.0037	0.1441	-0.0592
165	0.1020	-0.0039	0.1289	-0.0851	231	0.1438	-0.0038	0.1574	-0.0596
166	0.1024	-0.0042	0.1308	-0.0537	232	0.1445	-0.0042	0.1340	-0.0875
167	0.1031	-0.0044	0.1590	-0.0518	233	0.1449	-0.0046	0.1164	-0.0708
168	0.1037	-0.0046	0.1627	-0.0559	234	0.1454	-0.0048	0.1161	-0.0464
169	0.1044	-0.0048	0.1757	-0.0360	235	0.1458	-0.0049	0.1393	-0.0413
170	0.1051	-0.0049	0.1748	-0.0265	236	0.1465	-0.0051	0.1669	-0.0373
171	0.1058	-0.0050	0.1787	-0.0097	237	0.1472	-0.0052	0.1522	-0.0206
172	0.1065	-0.0050	0.1857	0.0047	238	0.1477	-0.0053	0.1444	-0.0436
173	0.1073	-0.0050	0.1709	0.0134	239	0.1483	-0.0056	0.1519	-0.0525
174	0.1079	-0.0049	0.1710	0.0105	240	0.1489	-0.0057	0.1477	-0.0483
175	0.1086	-0.0049	0.1655	0.0124	241	0.1495	-0.0060	0.1682	-0.0513
176	0.1092	-0.0048	0.1370	0.0409	242	0.1503	-0.0061	0.1867	-0.0249
177	0.1097	-0.0046	0.1587	0.0332	243	0.1510	-0.0062	0.1859	-0.0092
178	0.1105	-0.0045	0.1599	0.0309	244	0.1518	-0.0062	0.1871	-0.0004
179	0.1110	-0.0043	0.1263	0.0719	245	0.1525	-0.0062	0.1829	-0.0016
180	0.1115	-0.0040	0.1460	0.0621	246	0.1532	-0.0062	0.1751	0.0107
181	0.1122	-0.0038	0.1470	0.0748	247	0.1539	-0.0061	0.1575	0.0419
182	0.1127	-0.0034	0.1196	0.1107	248	0.1545	-0.0059	0.1541	0.0431
183	0.1131	-0.0029	0.1367	0.0696	249	0.1551	-0.0057	0.1596	0.0396
184	0.1137	-0.0028	0.1582	0.0292	250	0.1558	-0.0055	0.1612	0.0555
185	0.1144	-0.0027	0.1599	0.0155	251	0.1564	-0.0053	0.1389	0.0636
186	0.1150	-0.0027	0.1647	0.0111	252	0.1569	-0.0050	0.1298	0.0722
187	0.1157	-0.0026	0.1728	0.0172	253	0.1575	-0.0047	0.1458	0.0549
188	0.1164	-0.0025	0.1659	0.0051	254	0.1581	-0.0046	0.1425	0.0493
189	0.1170	-0.0026	0.1747	-0.0118	255	0.1586	-0.0043	0.1385	0.0641
190	0.1178	-0.0026	0.1865	-0.0164	256	0.1592	-0.0041	0.1540	0.0543
191	0.1185	-0.0027	0.1714	-0.0148	257	0.1598	-0.0039	0.1602	0.0355
192	0.1192	-0.0027	0.1684	-0.0200	258	0.1604	-0.0038	0.1544	0.0349
193	0.1199	-0.0029	0.1633	-0.0465	259	0.1611	-0.0036	0.1703	0.0315
194	0.1205	-0.0031	0.1465	-0.0664	260	0.1618	-0.0035	0.1878	0.0135

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	0.1626	-0.0035	0.1919	0.0010
261	0.1626	-0.0035	0.1919	0.0010	286	0.1790	-0.0066	0.1367	0.0766
262	0.1633	-0.0035	0.1954	-0.0137	287	0.1794	-0.0063	0.1186	0.0736
263	0.1641	-0.0036	0.1936	-0.0194	288	0.1799	-0.0060	0.1264	0.0567
264	0.1649	-0.0037	0.1801	-0.0168	289	0.1805	-0.0058	0.1651	0.0347
265	0.1656	-0.0037	0.1718	-0.0329	290	0.1813	-0.0058	0.1676	-0.0129
266	0.1663	-0.0040	0.1633	-0.0560	291	0.1818	-0.0059	0.1485	-0.0073
267	0.1669	-0.0042	0.1489	-0.0633	292	0.1824	-0.0058	0.1444	0.0258
268	0.1675	-0.0045	0.1450	-0.0647	293	0.1830	-0.0057	0.1554	0.0294
269	0.1680	-0.0047	0.1329	-0.0748	294	0.1837	-0.0056	0.1702	0.0671
270	0.1685	-0.0051	0.1253	-0.0715	295	0.1843	-0.0052	0.1549	0.0624
271	0.1690	-0.0053	0.1397	-0.0592	296	0.1849	-0.0051	0.1610	0.0181
272	0.1696	-0.0055	0.1393	-0.0691	297	0.1856	-0.0050	0.1705	0.0212
273	0.1702	-0.0058	0.1395	-0.0715	298	0.1863	-0.0049	0.1821	0.0143
274	0.1708	-0.0061	0.1523	-0.0671	299	0.1871	-0.0049	0.1887	-0.0022
275	0.1714	-0.0064	0.1499	-0.0483	300	0.1878	-0.0049	0.1950	-0.0129
276	0.1720	-0.0065	0.1537	-0.0472	301	0.1886	-0.0050	0.1930	-0.0391
277	0.1726	-0.0067	0.1692	-0.0550	302	0.1893	-0.0053	0.1815	-0.0463
278	0.1733	-0.0069	0.1781	-0.0362	303	0.1901	-0.0054	0.1702	-0.0516
279	0.1740	-0.0070	0.1782	-0.0311	304	0.1907	-0.0057	0.1443	-0.0841
280	0.1747	-0.0072	0.1739	-0.0324	305	0.1912	-0.0061	0.1496	-0.1032
281	0.1754	-0.0073	0.1827	-0.0200	306	0.1919	-0.0065	0.1547	-0.1083
282	0.1762	-0.0073	0.1937	0.0124	307	0.1925	-0.0069	0.1238	-0.1109
283	0.1770	-0.0072	0.1821	0.0292	308	0.1929	-0.0074	0.1083	-0.0825
284	0.1777	-0.0071	0.1729	0.0362	309	0.1933	-0.0076	-	-
285	0.1784	-0.0069	0.1672	0.0584					

Table B2.8 Raw data of free-rising EPS-2.625-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0458	-0.0052	0.1962	-0.0223
2	0.0008	0.0001	0.1880	0.0189	66	0.0466	-0.0053	0.1976	-0.0014
3	0.0015	0.0002	0.1784	0.0289	67	0.0474	-0.0052	0.1909	0.0094
4	0.0022	0.0003	0.1765	0.0268	68	0.0481	-0.0052	0.1850	0.0239
5	0.0029	0.0004	0.1721	0.0225	69	0.0488	-0.0050	0.1696	0.0446
6	0.0036	0.0005	0.1828	0.0142	70	0.0495	-0.0048	0.1632	0.0539
7	0.0044	0.0005	0.1984	0.0005	71	0.0502	-0.0046	0.1745	0.0562
8	0.0051	0.0005	0.2001	-0.0017	72	0.0509	-0.0044	0.1677	0.0599
9	0.0060	0.0005	0.2060	-0.0058	73	0.0515	-0.0041	0.1576	0.0769
10	0.0068	0.0004	0.2016	-0.0101	74	0.0521	-0.0038	0.1511	0.0732
11	0.0076	0.0004	0.2003	-0.0261	75	0.0527	-0.0036	0.1498	0.0780
12	0.0084	0.0002	0.1995	-0.0672	76	0.0533	-0.0032	0.1572	0.0829
13	0.0092	-0.0002	0.2009	-0.0750	77	0.0540	-0.0029	0.1638	0.0675
14	0.0100	-0.0004	0.1932	-0.0683	78	0.0546	-0.0026	0.1663	0.0711
15	0.0107	-0.0007	0.1751	-0.0797	79	0.0553	-0.0023	0.1739	0.0696
16	0.0114	-0.0010	0.1647	-0.0758	80	0.0560	-0.0021	0.1913	0.0555
17	0.0121	-0.0013	0.1675	-0.0883	81	0.0568	-0.0019	0.2026	0.0367
18	0.0127	-0.0017	0.1759	-0.0858	82	0.0576	-0.0018	0.2034	0.0486
19	0.0135	-0.0020	0.1767	-0.0735	83	0.0584	-0.0015	0.2046	0.0376
20	0.0142	-0.0023	0.1806	-0.0914	84	0.0593	-0.0015	0.2112	0.0003
21	0.0149	-0.0027	0.1791	-0.0908	85	0.0601	-0.0015	0.2100	-0.0136
22	0.0156	-0.0030	0.1820	-0.0736	86	0.0610	-0.0016	0.1932	-0.0401
23	0.0164	-0.0033	0.1946	-0.0651	87	0.0617	-0.0018	0.1752	-0.0530
24	0.0172	-0.0036	0.2015	-0.0541	88	0.0624	-0.0020	0.1729	-0.0463
25	0.0180	-0.0037	0.2119	-0.0382	89	0.0631	-0.0022	0.1635	-0.0593
26	0.0188	-0.0039	0.2133	-0.0237	90	0.0637	-0.0025	0.1496	-0.0711
27	0.0197	-0.0039	0.2111	-0.0174	91	0.0643	-0.0027	0.1533	-0.0644
28	0.0205	-0.0040	0.2092	-0.0059	92	0.0649	-0.0030	0.1580	-0.0786
29	0.0214	-0.0040	0.2047	0.0140	93	0.0655	-0.0034	0.1642	-0.0778
30	0.0222	-0.0039	0.1920	0.0330	94	0.0662	-0.0036	0.1608	-0.0589
31	0.0229	-0.0037	0.1799	0.0400	95	0.0668	-0.0038	0.1605	-0.0697
32	0.0236	-0.0036	0.1665	0.0555	96	0.0675	-0.0042	0.1688	-0.0673
33	0.0242	-0.0033	0.1550	0.0778	97	0.0682	-0.0044	0.1782	-0.0480
34	0.0249	-0.0029	0.1395	0.0726	98	0.0689	-0.0045	0.1875	-0.0438
35	0.0253	-0.0027	0.1363	0.0672	99	0.0697	-0.0047	0.1970	-0.0541
36	0.0259	-0.0024	0.1405	0.0752	100	0.0705	-0.0050	0.2052	-0.0409
37	0.0265	-0.0021	0.1363	0.0687	101	0.0713	-0.0051	0.2023	-0.0113
38	0.0270	-0.0019	0.1476	0.0496	102	0.0721	-0.0051	0.2009	0.0039
39	0.0276	-0.0017	0.1555	0.0669	103	0.0729	-0.0050	0.1971	0.0011
40	0.0283	-0.0013	0.1693	0.0708	104	0.0737	-0.0051	0.1790	0.0040
41	0.0290	-0.0011	0.1723	0.0421	105	0.0743	-0.0050	0.1738	0.0208
42	0.0297	-0.0010	0.1729	0.0388	106	0.0751	-0.0049	0.1729	0.0242
43	0.0304	-0.0008	0.1866	0.0395	107	0.0757	-0.0048	0.1685	0.0356
44	0.0311	-0.0007	0.2014	0.0271	108	0.0764	-0.0046	0.1685	0.0478
45	0.0320	-0.0006	0.2099	0.0062	109	0.0771	-0.0044	0.1617	0.0519
46	0.0328	-0.0006	0.2134	-0.0129	110	0.0777	-0.0042	0.1636	0.0543
47	0.0337	-0.0007	0.2105	-0.0183	111	0.0784	-0.0040	0.1616	0.0632
48	0.0345	-0.0008	0.2039	-0.0342	112	0.0790	-0.0037	0.1639	0.0552
49	0.0353	-0.0010	0.1965	-0.0598	113	0.0797	-0.0035	0.1743	0.0417
50	0.0361	-0.0012	0.1870	-0.0693	114	0.0804	-0.0034	0.1835	0.0508
51	0.0368	-0.0015	0.1647	-0.0876	115	0.0812	-0.0031	0.1789	0.0518
52	0.0374	-0.0019	0.1496	-0.0873	116	0.0818	-0.0029	0.1833	0.0512
53	0.0380	-0.0022	0.1462	-0.0990	117	0.0826	-0.0027	0.2014	0.0365
54	0.0386	-0.0027	0.1372	-0.0956	118	0.0834	-0.0026	0.2021	0.0133
55	0.0391	-0.0030	0.1397	-0.0736	119	0.0842	-0.0026	0.2023	0.0159
56	0.0397	-0.0033	0.1442	-0.0782	120	0.0851	-0.0025	0.2053	0.0149
57	0.0403	-0.0036	0.1454	-0.0648	121	0.0859	-0.0025	0.2018	-0.0011
58	0.0408	-0.0038	0.1497	-0.0772	122	0.0867	-0.0025	0.1675	-0.0207
59	0.0415	-0.0042	0.1637	-0.0727	123	0.0872	-0.0027	0.1696	-0.0613
60	0.0422	-0.0044	0.1715	-0.0490	124	0.0880	-0.0030	0.1897	-0.0620
61	0.0428	-0.0046	0.1745	-0.0498	125	0.0887	-0.0032	0.1646	-0.0529
62	0.0436	-0.0048	0.1808	-0.0543	126	0.0894	-0.0034	0.1359	-0.0711
63	0.0443	-0.0051	0.1814	-0.0337	127	0.0898	-0.0037	0.1471	-0.0499
64	0.0450	-0.0051	0.1872	-0.0204	128	0.0905	-0.0038	0.1739	-0.0352

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0912	-0.0040	0.1713	-0.0537	195	0.1376	-0.0027	0.2025	-0.0249
130	0.0919	-0.0043	0.1723	-0.0586	196	0.1384	-0.0028	0.1980	-0.0507
131	0.0926	-0.0045	0.1748	-0.0531	197	0.1392	-0.0031	0.1951	-0.0644
132	0.0933	-0.0047	0.1914	-0.0350	198	0.1400	-0.0033	0.1550	-0.0621
133	0.0941	-0.0048	0.2106	-0.0207	199	0.1404	-0.0036	0.1158	-0.0620
134	0.0950	-0.0049	0.2109	-0.0265	200	0.1409	-0.0038	0.1426	-0.0798
135	0.0958	-0.0050	0.2106	-0.0275	201	0.1416	-0.0042	0.1669	-0.0921
136	0.0967	-0.0051	0.2107	-0.0141	202	0.1422	-0.0046	0.1578	-0.0641
137	0.0975	-0.0051	0.2080	0.0001	203	0.1428	-0.0047	0.1655	-0.0643
138	0.0983	-0.0051	0.1946	0.0043	204	0.1435	-0.0051	0.1790	-0.0809
139	0.0991	-0.0051	0.1788	0.0231	205	0.1443	-0.0054	0.1808	-0.0571
140	0.0998	-0.0049	0.1656	0.0272	206	0.1450	-0.0055	0.1930	-0.0450
141	0.1004	-0.0048	0.1588	0.0237	207	0.1458	-0.0057	0.2064	-0.0514
142	0.1010	-0.0047	0.1484	0.0329	208	0.1466	-0.0059	0.2058	-0.0366
143	0.1016	-0.0046	0.1430	0.0402	209	0.1475	-0.0060	0.2092	-0.0068
144	0.1022	-0.0044	0.1444	0.0418	210	0.1483	-0.0060	0.2075	0.0082
145	0.1027	-0.0042	0.1391	0.0338	211	0.1491	-0.0060	0.2018	0.0109
146	0.1033	-0.0041	0.1372	0.0406	212	0.1499	-0.0059	0.1991	0.0207
147	0.1038	-0.0039	0.1470	0.0398	213	0.1507	-0.0058	0.1923	0.0411
148	0.1045	-0.0038	0.1596	0.0339	214	0.1515	-0.0056	0.1788	0.0508
149	0.1051	-0.0036	0.1632	0.0282	215	0.1521	-0.0054	0.1701	0.0619
150	0.1058	-0.0036	0.1789	0.0231	216	0.1528	-0.0051	0.1797	0.0440
151	0.1065	-0.0035	0.1876	0.0320	217	0.1536	-0.0050	0.1682	0.0259
152	0.1073	-0.0033	0.1808	0.0157	218	0.1542	-0.0049	0.1447	0.0767
153	0.1080	-0.0033	0.1854	-0.0041	219	0.1547	-0.0044	0.1371	0.1138
154	0.1088	-0.0034	0.1965	-0.0131	220	0.1553	-0.0040	0.1629	0.0637
155	0.1096	-0.0034	0.1982	-0.0200	221	0.1560	-0.0039	0.1760	0.0155
156	0.1103	-0.0035	0.2020	-0.0312	222	0.1567	-0.0039	0.1801	0.0172
157	0.1112	-0.0037	0.2031	-0.0525	223	0.1575	-0.0038	0.1759	0.0259
158	0.1120	-0.0039	0.1843	-0.0608	224	0.1581	-0.0036	0.1795	0.0199
159	0.1126	-0.0042	0.1563	-0.0640	225	0.1589	-0.0036	0.2089	0.0062
160	0.1132	-0.0044	0.1461	-0.0633	226	0.1598	-0.0036	0.2091	0.0025
161	0.1138	-0.0047	0.1410	-0.0709	227	0.1606	-0.0036	0.2077	-0.0077
162	0.1143	-0.0050	0.1408	-0.0698	228	0.1614	-0.0037	0.2060	-0.0091
163	0.1149	-0.0052	0.1378	-0.0550	229	0.1622	-0.0037	0.2065	-0.0210
164	0.1154	-0.0055	0.1358	-0.0658	230	0.1631	-0.0038	0.1914	-0.0485
165	0.1160	-0.0058	0.1552	-0.0658	231	0.1638	-0.0041	0.1837	-0.0728
166	0.1167	-0.0060	0.1448	-0.0566	232	0.1645	-0.0044	0.1680	-0.0641
167	0.1172	-0.0062	0.1486	-0.0428	233	0.1651	-0.0046	0.1389	-0.0687
168	0.1179	-0.0063	0.1781	-0.0292	234	0.1656	-0.0050	0.1503	-0.0761
169	0.1186	-0.0065	0.1860	-0.0296	235	0.1663	-0.0052	0.1458	-0.0498
170	0.1194	-0.0066	0.1971	-0.0337	236	0.1668	-0.0054	0.1379	-0.0552
171	0.1202	-0.0067	0.2086	-0.0238	237	0.1674	-0.0056	0.1558	-0.0701
172	0.1210	-0.0067	0.2104	-0.0026	238	0.1681	-0.0059	0.1702	-0.0561
173	0.1219	-0.0067	0.2133	0.0037	239	0.1688	-0.0061	0.1824	-0.0386
174	0.1227	-0.0067	0.2136	0.0134	240	0.1695	-0.0062	0.1763	-0.0397
175	0.1236	-0.0066	0.2071	0.0235	241	0.1702	-0.0064	0.1770	-0.0404
176	0.1244	-0.0065	0.1993	0.0575	242	0.1709	-0.0065	0.1882	-0.0363
177	0.1252	-0.0062	0.1923	0.0798	243	0.1717	-0.0067	0.2009	-0.0183
178	0.1259	-0.0059	0.1716	0.0830	244	0.1725	-0.0067	0.2107	0.0036
179	0.1265	-0.0055	0.1486	0.0835	245	0.1734	-0.0067	0.2087	0.0144
180	0.1271	-0.0052	0.1460	0.0821	246	0.1742	-0.0066	0.2128	0.0208
181	0.1277	-0.0049	0.1479	0.0899	247	0.1751	-0.0065	0.2036	0.0196
182	0.1283	-0.0045	0.1334	0.0826	248	0.1758	-0.0064	0.1845	0.0351
183	0.1288	-0.0042	0.1314	0.0769	249	0.1766	-0.0062	0.1835	0.0522
184	0.1294	-0.0039	0.1472	0.0738	250	0.1773	-0.0060	0.1683	0.0485
185	0.1300	-0.0036	0.1504	0.0670	251	0.1779	-0.0058	0.1538	0.0585
186	0.1306	-0.0034	0.1567	0.0674	252	0.1785	-0.0055	0.1429	0.0603
187	0.1312	-0.0031	0.1706	0.0488	253	0.1790	-0.0053	0.1414	0.0493
188	0.1319	-0.0030	0.1797	0.0321	254	0.1797	-0.0051	0.1425	0.0575
189	0.1326	-0.0028	0.1885	0.0415	255	0.1802	-0.0049	0.1389	0.0470
190	0.1334	-0.0026	0.2041	0.0309	256	0.1808	-0.0048	0.1458	0.0433
191	0.1343	-0.0026	0.2104	0.0107	257	0.1813	-0.0045	0.1574	0.0422
192	0.1351	-0.0025	0.2067	0.0003	258	0.1820	-0.0044	0.1596	0.0416
193	0.1359	-0.0026	0.2071	-0.0091	259	0.1826	-0.0042	0.1659	0.0487
194	0.1368	-0.0026	0.2083	-0.0148	260	0.1834	-0.0040	0.1904	0.0263

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
261	0.1841	-0.0040	0.1988	0.0147	285	0.2014	-0.0086	0.1982	0.0165
262	0.1850	-0.0039	0.1983	0.0050	286	0.2022	-0.0085	0.1878	0.0298
263	0.1857	-0.0039	0.1983	-0.0096	287	0.2030	-0.0083	0.1718	0.0507
264	0.1865	-0.0040	0.2058	-0.0174	288	0.2036	-0.0081	0.1675	0.0532
265	0.1874	-0.0041	0.2071	-0.0184	289	0.2043	-0.0079	0.1653	0.0604
266	0.1882	-0.0041	0.1982	-0.0295	290	0.2049	-0.0076	0.1499	0.0604
267	0.1890	-0.0043	0.1866	-0.0549	291	0.2055	-0.0074	0.1481	0.0625
268	0.1897	-0.0046	0.1792	-0.0738	292	0.2061	-0.0071	0.1661	0.0616
269	0.1904	-0.0049	0.1733	-0.0924	293	0.2068	-0.0069	0.1607	0.0605
270	0.1911	-0.0053	0.1617	-0.0796	294	0.2074	-0.0066	0.1645	0.0676
271	0.1917	-0.0056	0.1456	-0.0841	295	0.2081	-0.0064	0.1712	0.0553
272	0.1922	-0.0060	0.1502	-0.0976	296	0.2088	-0.0062	0.1696	0.0419
273	0.1929	-0.0063	0.1490	-0.0729	297	0.2095	-0.0060	0.1827	0.0349
274	0.1934	-0.0066	0.1361	-0.0777	298	0.2102	-0.0059	0.1965	0.0405
275	0.1940	-0.0070	0.1530	-0.0853	299	0.2111	-0.0057	0.2095	0.0275
276	0.1947	-0.0073	0.1682	-0.0817	300	0.2119	-0.0057	0.2082	0.0045
277	0.1953	-0.0076	0.1723	-0.0798	301	0.2127	-0.0057	0.2071	-0.0050
278	0.1960	-0.0079	0.1810	-0.0608	302	0.2136	-0.0057	0.2012	-0.0155
279	0.1968	-0.0081	0.1780	-0.0509	303	0.2143	-0.0058	0.2019	-0.0439
280	0.1975	-0.0083	0.1834	-0.0532	304	0.2152	-0.0061	0.1929	-0.0590
281	0.1982	-0.0085	0.2009	-0.0355	305	0.2159	-0.0063	0.1678	-0.0578
282	0.1991	-0.0086	0.2017	-0.0130	306	0.2165	-0.0065	0.1491	-0.0656
283	0.1999	-0.0086	0.1969	-0.0050	307	0.2171	-0.0068	-	-
284	0.2006	-0.0086	0.1989	0.0074					

Table B2.9 Raw data of free-rising EPS-3.091-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0458	-0.0012	0.1400	-0.0547
2	0.0008	-0.0001	0.1953	-0.0219	66	0.0462	-0.0014	0.1095	-0.0429
3	0.0016	-0.0002	0.2117	-0.0208	67	0.0467	-0.0016	0.1389	-0.0388
4	0.0025	-0.0002	0.2118	-0.0292	68	0.0473	-0.0017	0.1515	-0.0411
5	0.0033	-0.0004	0.1949	-0.0256	69	0.0479	-0.0019	0.1618	-0.0408
6	0.0040	-0.0005	0.1928	-0.0081	70	0.0486	-0.0021	0.1671	-0.0423
7	0.0048	-0.0005	0.1912	-0.0005	71	0.0492	-0.0022	0.1599	-0.0384
8	0.0056	-0.0005	0.1907	0.0076	72	0.0499	-0.0024	0.1741	-0.0358
9	0.0063	-0.0004	0.1641	0.0080	73	0.0506	-0.0025	0.1852	-0.0431
10	0.0069	-0.0004	0.1427	0.0106	74	0.0514	-0.0027	0.1975	-0.0404
11	0.0075	-0.0003	0.1504	0.0112	75	0.0522	-0.0028	0.2038	-0.0380
12	0.0081	-0.0003	0.1390	0.0209	76	0.0530	-0.0030	0.2012	-0.0382
13	0.0086	-0.0002	0.1438	0.0305	77	0.0538	-0.0032	0.2107	-0.0257
14	0.0092	-0.0001	0.1826	0.0308	78	0.0547	-0.0032	0.2159	-0.0196
15	0.0100	0.0001	0.1802	0.0222	79	0.0555	-0.0033	0.2132	-0.0194
16	0.0107	0.0001	0.1743	0.0074	80	0.0564	-0.0034	0.2117	-0.0090
17	0.0114	0.0001	0.1916	0.0004	81	0.0572	-0.0034	0.2172	0.0086
18	0.0122	0.0001	0.1729	0.0123	82	0.0581	-0.0033	0.2321	0.0213
19	0.0128	0.0002	0.1761	0.0160	83	0.0591	-0.0032	0.2316	0.0392
20	0.0136	0.0003	0.2017	0.0015	84	0.0600	-0.0030	0.2133	0.0578
21	0.0144	0.0003	0.2017	-0.0014	85	0.0608	-0.0027	0.2017	0.0749
22	0.0152	0.0002	0.2038	-0.0045	86	0.0616	-0.0024	0.2019	0.0766
23	0.0161	0.0002	0.2024	-0.0030	87	0.0624	-0.0021	0.1802	0.0758
24	0.0169	0.0002	0.1985	-0.0053	88	0.0630	-0.0018	0.1673	0.0794
25	0.0176	0.0002	0.1712	-0.0076	89	0.0638	-0.0015	0.1645	0.0763
26	0.0182	0.0002	0.1496	-0.0081	90	0.0644	-0.0012	0.1503	0.0807
27	0.0188	0.0001	0.1640	-0.0110	91	0.0650	-0.0009	0.1585	0.0654
28	0.0195	0.0001	0.1642	-0.0248	92	0.0656	-0.0007	0.1685	0.0500
29	0.0202	-0.0001	0.1484	-0.0421	93	0.0663	-0.0005	0.1687	0.0478
30	0.0207	-0.0003	0.1465	-0.0376	94	0.0670	-0.0003	0.1818	0.0455
31	0.0213	-0.0004	0.1408	-0.0359	95	0.0678	-0.0001	0.1974	0.0356
32	0.0219	-0.0006	0.1328	-0.0404	96	0.0686	0.0000	0.2101	0.0228
33	0.0224	-0.0007	0.1435	-0.0498	97	0.0694	0.0001	0.2159	0.0213
34	0.0230	-0.0010	0.1522	-0.0521	98	0.0703	0.0002	0.2110	0.0120
35	0.0236	-0.0011	0.1591	-0.0336	99	0.0711	0.0002	0.2054	-0.0020
36	0.0243	-0.0012	0.1649	-0.0323	100	0.0719	0.0002	0.2046	-0.0175
37	0.0249	-0.0014	0.1783	-0.0366	101	0.0728	0.0001	0.2053	-0.0365
38	0.0257	-0.0015	0.1930	-0.0396	102	0.0736	-0.0001	0.2011	-0.0554
39	0.0265	-0.0017	0.1869	-0.0475	103	0.0744	-0.0004	0.1873	-0.0607
40	0.0272	-0.0019	0.1898	-0.0313	104	0.0751	-0.0006	0.1748	-0.0531
41	0.0280	-0.0020	0.2025	-0.0102	105	0.0758	-0.0008	0.1667	-0.0595
42	0.0288	-0.0020	0.2145	-0.0098	106	0.0764	-0.0011	0.1605	-0.0577
43	0.0297	-0.0020	0.2212	-0.0097	107	0.0771	-0.0013	0.1585	-0.0485
44	0.0306	-0.0021	0.2195	-0.0041	108	0.0777	-0.0015	0.1641	-0.0552
45	0.0315	-0.0021	0.2047	0.0076	109	0.0784	-0.0017	0.1689	-0.0597
46	0.0322	-0.0020	0.1857	0.0341	110	0.0790	-0.0020	0.1598	-0.0509
47	0.0329	-0.0018	0.1792	0.0426	111	0.0796	-0.0021	0.1620	-0.0428
48	0.0337	-0.0017	0.1732	0.0441	112	0.0803	-0.0023	0.1780	-0.0447
49	0.0343	-0.0014	0.1450	0.0401	113	0.0811	-0.0025	0.1869	-0.0492
50	0.0348	-0.0013	0.1450	0.0302	114	0.0818	-0.0027	0.1935	-0.0457
51	0.0355	-0.0012	0.1471	0.0332	115	0.0826	-0.0029	0.2006	-0.0413
52	0.0360	-0.0011	0.1320	0.0400	116	0.0834	-0.0030	0.2033	-0.0322
53	0.0366	-0.0009	0.1397	0.0466	117	0.0842	-0.0031	0.2089	-0.0214
54	0.0371	-0.0007	0.1652	0.0356	118	0.0851	-0.0032	0.2087	-0.0146
55	0.0379	-0.0006	0.1928	0.0249	119	0.0859	-0.0032	0.2112	-0.0009
56	0.0386	-0.0005	0.2022	0.0179	120	0.0868	-0.0032	0.2117	0.0138
57	0.0395	-0.0004	0.2148	0.0142	121	0.0876	-0.0031	0.2180	0.0262
58	0.0404	-0.0004	0.2147	0.0081	122	0.0885	-0.0030	0.2462	0.0276
59	0.0412	-0.0004	0.2159	-0.0060	123	0.0896	-0.0029	0.2360	0.0341
60	0.0421	-0.0004	0.2120	-0.0141	124	0.0904	-0.0027	0.1965	0.0708
61	0.0429	-0.0005	0.2056	-0.0206	125	0.0911	-0.0023	0.1899	0.0770
62	0.0437	-0.0006	0.1941	-0.0277	126	0.0919	-0.0021	0.1717	0.0656
63	0.0445	-0.0007	0.1683	-0.0498	127	0.0925	-0.0018	0.1512	0.0768
64	0.0451	-0.0010	0.1691	-0.0635	128	0.0931	-0.0015	0.1454	0.0650

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0937	-0.0013	0.1371	0.0546	195	0.1428	-0.0034	0.2035	-0.0533
130	0.0942	-0.0011	0.1457	0.0588	196	0.1436	-0.0037	0.2113	-0.0490
131	0.0949	-0.0008	0.1678	0.0477	197	0.1445	-0.0038	0.2203	-0.0339
132	0.0956	-0.0007	0.1859	0.0361	198	0.1453	-0.0039	0.2143	-0.0164
133	0.0963	-0.0005	0.2000	0.0308	199	0.1462	-0.0040	0.2137	-0.0076
134	0.0972	-0.0004	0.2117	0.0283	200	0.1471	-0.0040	0.2165	0.0017
135	0.0980	-0.0003	0.2107	0.0310	201	0.1479	-0.0040	0.2119	0.0100
136	0.0989	-0.0002	0.2109	0.0198	202	0.1487	-0.0039	0.2170	0.0199
137	0.0997	-0.0001	0.2201	-0.0001	203	0.1497	-0.0038	0.2196	0.0303
138	0.1006	-0.0002	0.2202	-0.0165	204	0.1505	-0.0037	0.2255	0.0604
139	0.1015	-0.0003	0.2100	-0.0276	205	0.1515	-0.0033	0.2217	0.0749
140	0.1023	-0.0004	0.2007	-0.0396	206	0.1523	-0.0031	0.2004	0.0723
141	0.1031	-0.0006	0.1917	-0.0532	207	0.1531	-0.0027	0.1813	0.0958
142	0.1038	-0.0008	0.1746	-0.0663	208	0.1537	-0.0023	0.1565	0.0959
143	0.1045	-0.0011	0.1497	-0.0597	209	0.1543	-0.0020	0.1388	0.0920
144	0.1050	-0.0013	0.1488	-0.0513	210	0.1548	-0.0016	0.1388	0.0891
145	0.1057	-0.0015	0.1587	-0.0497	211	0.1554	-0.0013	0.1706	0.0675
146	0.1063	-0.0017	0.1602	-0.0518	212	0.1562	-0.0010	0.1798	0.0702
147	0.1070	-0.0019	0.1537	-0.0498	213	0.1569	-0.0007	0.1621	0.0687
148	0.1075	-0.0021	0.1511	-0.0464	214	0.1575	-0.0005	0.1900	0.0430
149	0.1082	-0.0023	0.1621	-0.0501	215	0.1584	-0.0004	0.2002	0.0460
150	0.1088	-0.0025	0.1741	-0.0570	216	0.1591	-0.0001	0.1914	0.0463
151	0.1096	-0.0028	0.1899	-0.0530	217	0.1599	0.0000	0.2123	0.0243
152	0.1103	-0.0029	0.1958	-0.0437	218	0.1608	0.0001	0.2175	0.0168
153	0.1111	-0.0031	0.1925	-0.0483	219	0.1617	0.0002	0.2136	0.0019
154	0.1119	-0.0033	0.1898	-0.0563	220	0.1625	0.0001	0.2172	-0.0136
155	0.1126	-0.0036	0.1990	-0.0552	221	0.1634	0.0000	0.2140	-0.0331
156	0.1135	-0.0038	0.2077	-0.0439	222	0.1642	-0.0002	0.2021	-0.0549
157	0.1143	-0.0039	0.2076	-0.0280	223	0.1650	-0.0004	0.1886	-0.0592
158	0.1151	-0.0040	0.2179	-0.0124	224	0.1657	-0.0006	0.1708	-0.0719
159	0.1160	-0.0040	0.2291	-0.0052	225	0.1664	-0.0010	0.1569	-0.0764
160	0.1170	-0.0040	0.2288	0.0055	226	0.1670	-0.0012	0.1524	-0.0668
161	0.1179	-0.0040	0.2225	0.0153	227	0.1676	-0.0015	0.1559	-0.0674
162	0.1188	-0.0039	0.2143	0.0250	228	0.1682	-0.0018	0.1586	-0.0741
163	0.1196	-0.0038	0.2145	0.0387	229	0.1689	-0.0021	0.1564	-0.0620
164	0.1205	-0.0036	0.2018	0.0724	230	0.1695	-0.0023	0.1557	-0.0557
165	0.1212	-0.0032	0.1725	0.0849	231	0.1701	-0.0025	0.1613	-0.0723
166	0.1219	-0.0029	0.1720	0.0771	232	0.1708	-0.0029	0.1748	-0.0718
167	0.1226	-0.0026	0.1813	0.0874	233	0.1715	-0.0031	0.1855	-0.0640
168	0.1233	-0.0022	0.1605	0.0795	234	0.1723	-0.0034	0.1976	-0.0700
169	0.1239	-0.0019	0.1462	0.0818	235	0.1731	-0.0037	0.2057	-0.0626
170	0.1245	-0.0016	0.1437	0.0815	236	0.1739	-0.0039	0.2107	-0.0467
171	0.1250	-0.0013	0.1532	0.0511	237	0.1748	-0.0040	0.2102	-0.0488
172	0.1257	-0.0011	0.1644	0.0575	238	0.1756	-0.0043	0.2194	-0.0525
173	0.1263	-0.0008	0.1645	0.0579	239	0.1765	-0.0045	0.2310	-0.0352
174	0.1270	-0.0007	0.1908	0.0390	240	0.1774	-0.0045	0.2250	-0.0216
175	0.1279	-0.0005	0.1984	0.0299	241	0.1783	-0.0046	0.2161	-0.0206
176	0.1286	-0.0004	0.1953	0.0176	242	0.1792	-0.0047	0.2091	0.0011
177	0.1294	-0.0004	0.2244	0.0116	243	0.1800	-0.0046	0.2176	0.0159
178	0.1304	-0.0004	0.2345	0.0110	244	0.1809	-0.0046	0.2274	0.0210
179	0.1313	-0.0003	0.2188	0.0010	245	0.1818	-0.0045	0.2042	0.0621
180	0.1321	-0.0003	0.2075	-0.0240	246	0.1825	-0.0041	0.1996	0.0746
181	0.1330	-0.0005	0.1997	-0.0419	247	0.1834	-0.0039	0.2021	0.0604
182	0.1337	-0.0007	0.1833	-0.0552	248	0.1842	-0.0036	0.1761	0.0922
183	0.1344	-0.0009	0.1641	-0.0656	249	0.1848	-0.0031	0.1578	0.1016
184	0.1351	-0.0012	0.1609	-0.0615	250	0.1854	-0.0028	0.1441	0.0849
185	0.1357	-0.0014	0.1650	-0.0469	251	0.1860	-0.0025	0.1427	0.0707
186	0.1364	-0.0016	0.1581	-0.0480	252	0.1866	-0.0022	0.1585	0.0530
187	0.1370	-0.0018	0.1608	-0.0543	253	0.1872	-0.0020	0.1596	0.0517
188	0.1377	-0.0020	0.1624	-0.0550	254	0.1878	-0.0018	0.1632	0.0634
189	0.1383	-0.0022	0.1604	-0.0486	255	0.1885	-0.0015	0.1757	0.0543
190	0.1389	-0.0024	0.1586	-0.0523	256	0.1892	-0.0014	0.1868	0.0293
191	0.1395	-0.0027	0.1680	-0.0596	257	0.1900	-0.0013	0.2041	0.0231
192	0.1403	-0.0029	0.1918	-0.0535	258	0.1909	-0.0012	0.2062	0.0098
193	0.1411	-0.0031	0.2083	-0.0439	259	0.1917	-0.0012	0.2093	-0.0002
194	0.1420	-0.0032	0.2126	-0.0451	260	0.1925	-0.0012	0.2126	-0.0141

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
261	0.1934	-0.0013	0.2096	-0.0288	274	0.2023	-0.0045	0.1869	-0.0804
262	0.1942	-0.0014	0.2046	-0.0283	275	0.2032	-0.0048	0.2064	-0.0631
263	0.1950	-0.0015	0.2001	-0.0413	276	0.2040	-0.0050	0.1960	-0.0664
264	0.1958	-0.0018	0.1919	-0.0705	277	0.2047	-0.0053	0.2061	-0.0638
265	0.1966	-0.0021	0.1813	-0.0677	278	0.2056	-0.0055	0.2139	-0.0425
266	0.1973	-0.0023	0.1650	-0.0531	279	0.2064	-0.0056	0.2040	-0.0288
267	0.1979	-0.0025	0.1403	-0.0795	280	0.2073	-0.0057	0.2083	-0.0334
268	0.1984	-0.0029	0.1491	-0.0752	281	0.2081	-0.0059	0.2048	-0.0247
269	0.1991	-0.0031	0.1696	-0.0529	282	0.2089	-0.0059	0.2021	0.0028
270	0.1998	-0.0034	0.1611	-0.0709	283	0.2097	-0.0059	0.2127	0.0130
271	0.2004	-0.0037	0.1472	-0.0725	284	0.2106	-0.0058	0.2100	0.0193
272	0.2009	-0.0039	0.1625	-0.0518	285	0.2114	-0.0057	0.2043	0.0366
273	0.2017	-0.0041	0.1764	-0.0681	286	0.2123	-0.0055	-	-

Table B2.10 Raw data of free-rising EPS-3.636-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0569	-0.0066	0.1871	0.1091
2	0.0006	-0.0001	0.1664	-0.0256	66	0.0575	-0.0062	0.1966	0.1066
3	0.0013	-0.0002	0.1488	-0.0293	67	0.0584	-0.0057	0.1960	0.1088
4	0.0018	-0.0003	0.1474	-0.0513	68	0.0591	-0.0053	0.1932	0.0987
5	0.0025	-0.0006	0.1699	-0.0462	69	0.0600	-0.0049	0.2019	0.0993
6	0.0032	-0.0007	0.1727	-0.0367	70	0.0607	-0.0045	0.2092	0.0988
7	0.0039	-0.0009	0.1791	-0.0394	71	0.0617	-0.0041	0.2086	0.0858
8	0.0046	-0.0010	0.1867	-0.0210	72	0.0624	-0.0038	0.2212	0.0724
9	0.0054	-0.0011	0.2058	-0.0250	73	0.0634	-0.0036	0.2424	0.0660
10	0.0063	-0.0012	0.2389	-0.0467	74	0.0643	-0.0033	0.2106	0.0575
11	0.0073	-0.0015	0.2474	-0.0495	75	0.0651	-0.0031	0.2320	0.0418
12	0.0083	-0.0016	0.2333	-0.0284	76	0.0662	-0.0030	0.2671	0.0428
13	0.0092	-0.0017	0.2690	-0.0321	77	0.0672	-0.0028	0.2664	0.0204
14	0.0104	-0.0019	0.2703	-0.0285	78	0.0683	-0.0028	0.2487	0.0007
15	0.0113	-0.0019	0.2553	-0.0213	79	0.0692	-0.0028	0.2596	-0.0099
16	0.0125	-0.0020	0.2841	-0.0132	80	0.0704	-0.0029	0.2608	-0.0256
17	0.0136	-0.0020	0.2582	-0.0036	81	0.0713	-0.0030	0.2583	-0.0379
18	0.0145	-0.0021	0.2339	-0.0111	82	0.0724	-0.0032	0.2550	-0.0644
19	0.0155	-0.0021	0.2442	-0.0038	83	0.0734	-0.0035	0.2408	-0.0754
20	0.0165	-0.0021	0.2371	0.0022	84	0.0744	-0.0038	0.2350	-0.0880
21	0.0174	-0.0021	0.2177	0.0028	85	0.0752	-0.0042	0.2274	-0.1018
22	0.0182	-0.0021	0.2108	0.0012	86	0.0762	-0.0046	0.2098	-0.1041
23	0.0191	-0.0021	0.2087	0.0006	87	0.0769	-0.0050	0.2040	-0.1118
24	0.0199	-0.0021	0.2123	-0.0033	88	0.0778	-0.0055	0.2035	-0.1098
25	0.0208	-0.0021	0.2160	-0.0034	89	0.0785	-0.0059	0.1846	-0.1233
26	0.0216	-0.0021	0.2166	-0.0044	90	0.0793	-0.0065	0.1772	-0.1294
27	0.0225	-0.0021	0.2011	0.0056	91	0.0800	-0.0069	0.2028	-0.1154
28	0.0232	-0.0021	0.2114	-0.0031	92	0.0809	-0.0074	0.1914	-0.1185
29	0.0242	-0.0022	0.2601	-0.0320	93	0.0815	-0.0079	0.1899	-0.1073
30	0.0253	-0.0023	0.2570	-0.0331	94	0.0824	-0.0083	0.2127	-0.1071
31	0.0262	-0.0024	0.2365	-0.0320	95	0.0832	-0.0087	0.2185	-0.1007
32	0.0272	-0.0026	0.2633	-0.0401	96	0.0842	-0.0091	0.2092	-0.0979
33	0.0283	-0.0027	0.2449	-0.0327	97	0.0849	-0.0095	0.2142	-0.0967
34	0.0292	-0.0028	0.2442	-0.0528	98	0.0859	-0.0099	0.2422	-0.0719
35	0.0303	-0.0032	0.2656	-0.0634	99	0.0868	-0.0101	0.2575	-0.0676
36	0.0313	-0.0033	0.2657	-0.0641	100	0.0879	-0.0104	0.2496	-0.0611
37	0.0324	-0.0037	0.2608	-0.0864	101	0.0888	-0.0106	0.2629	-0.0464
38	0.0334	-0.0040	0.2431	-0.0825	102	0.0900	-0.0108	0.2674	-0.0334
39	0.0344	-0.0043	0.2437	-0.0984	103	0.0909	-0.0108	0.2305	-0.0114
40	0.0353	-0.0048	0.2271	-0.0970	104	0.0919	-0.0109	0.2522	0.0036
41	0.0362	-0.0051	0.2063	-0.1078	105	0.0930	-0.0108	0.2743	0.0160
42	0.0370	-0.0057	0.1973	-0.1125	106	0.0941	-0.0107	0.2264	0.0380
43	0.0378	-0.0060	0.1959	-0.1126	107	0.0948	-0.0105	0.2197	0.0795
44	0.0385	-0.0066	0.1862	-0.1254	108	0.0958	-0.0101	0.2401	0.0860
45	0.0392	-0.0070	0.1870	-0.1119	109	0.0967	-0.0098	0.1975	0.0794
46	0.0400	-0.0075	0.1897	-0.1038	110	0.0974	-0.0095	0.1733	0.0776
47	0.0408	-0.0078	0.1804	-0.0926	111	0.0981	-0.0092	0.1781	0.0873
48	0.0415	-0.0082	0.1862	-0.0930	112	0.0988	-0.0088	0.1722	0.1147
49	0.0423	-0.0086	0.2110	-0.0955	113	0.0995	-0.0083	0.1604	0.0988
50	0.0432	-0.0090	0.1934	-0.0773	114	0.1001	-0.0080	0.1873	0.1000
51	0.0438	-0.0092	0.1987	-0.0592	115	0.1010	-0.0075	0.1733	0.1088
52	0.0447	-0.0095	0.2330	-0.0534	116	0.1015	-0.0071	0.1804	0.0931
53	0.0457	-0.0096	0.2147	-0.0284	117	0.1024	-0.0067	0.1955	0.1022
54	0.0465	-0.0097	0.2264	-0.0082	118	0.1031	-0.0063	0.1921	0.0894
55	0.0475	-0.0097	0.2483	-0.0084	119	0.1039	-0.0060	0.2221	0.0846
56	0.0485	-0.0098	0.2559	0.0032	120	0.1049	-0.0056	0.2028	0.0762
57	0.0495	-0.0097	0.2588	0.0381	121	0.1056	-0.0054	0.2238	0.0624
58	0.0505	-0.0094	0.2564	0.0638	122	0.1066	-0.0051	0.2673	0.0635
59	0.0516	-0.0092	0.2356	0.0772	123	0.1077	-0.0049	0.2491	0.0445
60	0.0524	-0.0088	0.2438	0.1028	124	0.1086	-0.0047	0.2419	0.0365
61	0.0535	-0.0083	0.2440	0.0986	125	0.1096	-0.0046	0.2530	0.0146
62	0.0544	-0.0080	0.2160	0.1140	126	0.1107	-0.0046	0.2846	-0.0066
63	0.0553	-0.0074	0.2061	0.1232	127	0.1119	-0.0047	0.2810	-0.0038
64	0.0560	-0.0071	0.2013	0.1075	128	0.1129	-0.0047	0.2738	-0.0197

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.1141	-0.0048	0.2596	-0.0480	191	0.1734	-0.0114	0.2139	0.1023
130	0.1150	-0.0050	0.2513	-0.0700	192	0.1742	-0.0110	0.1782	0.0980
131	0.1161	-0.0054	0.2330	-0.0666	193	0.1748	-0.0106	0.1609	0.0820
132	0.1169	-0.0056	0.2183	-0.0629	194	0.1754	-0.0103	0.1833	0.0983
133	0.1179	-0.0059	0.2365	-0.0774	195	0.1762	-0.0099	0.1770	0.0961
134	0.1187	-0.0062	0.2286	-0.0771	196	0.1769	-0.0095	0.1741	0.0803
135	0.1197	-0.0065	0.2233	-0.0762	197	0.1776	-0.0092	0.1761	0.0855
136	0.1205	-0.0068	0.2186	-0.0758	198	0.1783	-0.0089	0.1817	0.0925
137	0.1214	-0.0071	0.2136	-0.0665	199	0.1791	-0.0085	0.2020	0.0821
138	0.1222	-0.0073	0.2125	-0.0644	200	0.1799	-0.0082	0.1986	0.0642
139	0.1231	-0.0076	0.2323	-0.0667	201	0.1807	-0.0080	0.2145	0.0701
140	0.1241	-0.0079	0.2338	-0.0469	202	0.1816	-0.0076	0.2357	0.0574
141	0.1250	-0.0080	0.2457	-0.0299	203	0.1826	-0.0075	0.2381	0.0373
142	0.1261	-0.0081	0.2601	-0.0307	204	0.1835	-0.0073	0.2406	0.0396
143	0.1271	-0.0082	0.2622	-0.0137	205	0.1845	-0.0072	0.2503	0.0263
144	0.1282	-0.0082	0.2657	-0.0038	206	0.1855	-0.0071	0.2577	0.0298
145	0.1292	-0.0083	0.2635	-0.0078	207	0.1866	-0.0069	0.2661	0.0312
146	0.1303	-0.0083	0.2774	0.0090	208	0.1876	-0.0069	0.2778	-0.0105
147	0.1314	-0.0082	0.2637	0.0107	209	0.1888	-0.0070	0.2711	-0.0201
148	0.1324	-0.0082	0.2690	0.0229	210	0.1898	-0.0070	0.2523	-0.0019
149	0.1336	-0.0080	0.2714	0.0620	211	0.1908	-0.0070	0.2607	-0.0205
150	0.1346	-0.0077	0.2593	0.0721	212	0.1919	-0.0072	0.2592	-0.0257
151	0.1357	-0.0074	0.2519	0.0413	213	0.1929	-0.0073	0.2532	-0.0495
152	0.1366	-0.0074	0.2575	0.0494	214	0.1939	-0.0076	0.2381	-0.0681
153	0.1377	-0.0071	0.2515	0.0665	215	0.1948	-0.0078	0.2032	-0.0558
154	0.1386	-0.0068	0.2517	0.0560	216	0.1955	-0.0080	0.2048	-0.0611
155	0.1397	-0.0066	0.2508	0.0602	217	0.1964	-0.0083	0.2136	-0.0613
156	0.1406	-0.0064	0.2508	0.0583	218	0.1972	-0.0085	0.1859	-0.0643
157	0.1417	-0.0061	0.2697	0.0454	219	0.1979	-0.0088	0.1811	-0.0621
158	0.1427	-0.0060	0.2601	0.0374	220	0.1987	-0.0090	0.2120	-0.0577
159	0.1438	-0.0058	0.2568	0.0282	221	0.1996	-0.0093	0.2018	-0.0518
160	0.1448	-0.0058	0.2515	0.0166	222	0.2003	-0.0095	0.1919	-0.0547
161	0.1458	-0.0057	0.2740	-0.0021	223	0.2011	-0.0097	0.2183	-0.0497
162	0.1470	-0.0058	0.2868	-0.0163	224	0.2021	-0.0098	0.2310	-0.0442
163	0.1481	-0.0058	0.2649	-0.0161	225	0.2030	-0.0101	0.2257	-0.0348
164	0.1491	-0.0059	0.2698	-0.0521	226	0.2039	-0.0101	0.2419	-0.0154
165	0.1503	-0.0063	0.2790	-0.0817	227	0.2049	-0.0102	0.2580	-0.0320
166	0.1513	-0.0066	0.2588	-0.0819	228	0.2059	-0.0104	0.2577	-0.0275
167	0.1524	-0.0069	0.2403	-0.1103	229	0.2070	-0.0104	0.2768	-0.0080
168	0.1533	-0.0075	0.2239	-0.1085	230	0.2081	-0.0104	0.2663	-0.0192
169	0.1541	-0.0078	0.2069	-0.1026	231	0.2091	-0.0106	0.2730	0.0024
170	0.1549	-0.0083	0.1996	-0.1200	232	0.2103	-0.0104	0.2902	0.0119
171	0.1557	-0.0087	0.1939	-0.1117	233	0.2114	-0.0105	0.2679	-0.0104
172	0.1565	-0.0092	0.1803	-0.1219	234	0.2125	-0.0105	0.2738	0.0095
173	0.1572	-0.0097	0.1895	-0.0968	235	0.2136	-0.0104	0.2827	0.0123
174	0.1580	-0.0099	0.1929	-0.0876	236	0.2147	-0.0104	0.2683	-0.0124
175	0.1587	-0.0104	0.1769	-0.1111	237	0.2158	-0.0105	0.2537	0.0048
176	0.1594	-0.0108	0.1828	-0.0988	238	0.2168	-0.0104	0.2590	0.0174
177	0.1602	-0.0112	0.1873	-0.0864	239	0.2178	-0.0103	0.2409	0.0097
178	0.1609	-0.0115	0.1980	-0.0766	240	0.2187	-0.0103	0.2155	0.0085
179	0.1618	-0.0118	0.2141	-0.0785	241	0.2196	-0.0103	0.2083	0.0035
180	0.1626	-0.0121	0.2229	-0.0714	242	0.2204	-0.0103	0.1984	0.0008
181	0.1636	-0.0124	0.2233	-0.0555	243	0.2211	-0.0103	0.1984	-0.0054
182	0.1644	-0.0126	0.2269	-0.0410	244	0.2219	-0.0103	0.2015	-0.0077
183	0.1654	-0.0127	0.2550	-0.0322	245	0.2228	-0.0103	0.2037	-0.0046
184	0.1664	-0.0128	0.2564	-0.0148	246	0.2236	-0.0103	0.2047	-0.0050
185	0.1674	-0.0128	0.2514	0.0154	247	0.2244	-0.0104	0.2084	-0.0051
186	0.1684	-0.0127	0.2619	0.0162	248	0.2252	-0.0104	0.2098	0.0007
187	0.1695	-0.0127	0.2547	0.0337	249	0.2261	-0.0104	0.2090	0.0036
188	0.1705	-0.0125	0.2477	0.0677	250	0.2269	-0.0104	0.2137	-0.0115
189	0.1715	-0.0122	0.2448	0.0838	251	0.2278	-0.0105	-	-
190	0.1724	-0.0118	0.2315	0.0916					

Table B2.11 Raw data of free-rising EPS-4.752-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0675	0.0050	0.2590	-0.0888
2	0.0010	0.0002	0.2368	0.0469	66	0.0684	0.0046	0.2141	-0.1023
3	0.0019	0.0004	0.2406	0.0341	67	0.0692	0.0042	0.1926	-0.1040
4	0.0029	0.0005	0.2351	0.0324	68	0.0699	0.0037	0.1384	-0.0888
5	0.0038	0.0006	0.2324	0.0389	69	0.0703	0.0035	0.1358	-0.0700
6	0.0047	0.0008	0.2556	0.0412	70	0.0710	0.0032	0.1761	-0.0664
7	0.0058	0.0010	0.2656	0.0327	71	0.0717	0.0029	0.1701	-0.0566
8	0.0069	0.0011	0.2852	0.0347	72	0.0724	0.0027	0.1826	-0.0412
9	0.0081	0.0012	0.3059	0.0344	73	0.0731	0.0026	0.2123	-0.0407
10	0.0093	0.0014	0.2988	0.0279	74	0.0741	0.0024	0.2210	-0.0420
11	0.0105	0.0015	0.3059	0.0315	75	0.0749	0.0023	0.2158	-0.0370
12	0.0118	0.0016	0.3205	0.0240	76	0.0758	0.0021	0.2187	-0.0420
13	0.0131	0.0017	0.3260	0.0177	77	0.0767	0.0019	0.2208	-0.0327
14	0.0144	0.0017	0.3195	0.0072	78	0.0775	0.0018	0.2282	-0.0178
15	0.0156	0.0017	0.3174	-0.0045	79	0.0785	0.0018	0.2774	-0.0278
16	0.0169	0.0017	0.3109	-0.0115	80	0.0798	0.0016	0.2912	-0.0295
17	0.0181	0.0016	0.2998	-0.0165	81	0.0808	0.0015	0.2809	-0.0148
18	0.0193	0.0016	0.2858	-0.0151	82	0.0820	0.0015	0.2888	-0.0075
19	0.0204	0.0015	0.2739	-0.0237	83	0.0831	0.0015	0.2861	0.0110
20	0.0215	0.0014	0.2511	-0.0325	84	0.0843	0.0016	0.3015	0.0145
21	0.0224	0.0012	0.2324	-0.0309	85	0.0855	0.0016	0.2925	0.0259
22	0.0233	0.0011	0.2280	-0.0239	86	0.0866	0.0018	0.3003	0.0499
23	0.0242	0.0010	0.2294	-0.0226	87	0.0879	0.0020	0.3025	0.0632
24	0.0252	0.0010	0.2328	-0.0298	88	0.0891	0.0023	0.2673	0.0896
25	0.0261	0.0008	0.2389	-0.0303	89	0.0901	0.0027	0.2907	0.1034
26	0.0271	0.0007	0.2456	-0.0155	90	0.0914	0.0031	0.2837	0.1060
27	0.0280	0.0007	0.2376	-0.0046	91	0.0923	0.0036	0.2726	0.1024
28	0.0290	0.0007	0.2554	0.0035	92	0.0936	0.0039	0.2428	0.1033
29	0.0301	0.0007	0.2645	0.0190	93	0.0943	0.0044	0.2139	0.1152
30	0.0311	0.0008	0.2428	0.0236	94	0.0953	0.0049	0.2230	0.1232
31	0.0320	0.0009	0.2533	0.0125	95	0.0961	0.0054	0.2297	0.1088
32	0.0331	0.0009	0.2964	0.0102	96	0.0971	0.0057	0.2629	0.1118
33	0.0344	0.0010	0.3146	0.0276	97	0.0982	0.0063	0.2479	0.1044
34	0.0357	0.0012	0.3004	0.0397	98	0.0991	0.0066	0.2672	0.0911
35	0.0368	0.0013	0.2832	0.0517	99	0.1003	0.0070	0.2745	0.1135
36	0.0379	0.0016	0.3058	0.0558	100	0.1013	0.0075	0.2507	0.1194
37	0.0393	0.0018	0.3024	0.0591	101	0.1023	0.0080	0.2651	0.0994
38	0.0403	0.0020	0.2626	0.0832	102	0.1034	0.0083	0.2873	0.0958
39	0.0414	0.0024	0.2830	0.0825	103	0.1046	0.0087	0.2835	0.1071
40	0.0426	0.0027	0.2747	0.0794	104	0.1057	0.0091	0.3011	0.1014
41	0.0436	0.0031	0.2264	0.0807	105	0.1070	0.0095	0.3087	0.1037
42	0.0444	0.0033	0.2141	0.0794	106	0.1082	0.0100	0.3126	0.0982
43	0.0453	0.0037	0.2265	0.0886	107	0.1095	0.0103	0.2945	0.0642
44	0.0462	0.0041	0.1990	0.0749	108	0.1105	0.0105	0.2992	0.0358
45	0.0469	0.0043	0.1750	0.0517	109	0.1119	0.0106	0.3227	0.0501
46	0.0476	0.0045	0.1929	0.0450	110	0.1131	0.0109	0.3018	0.0625
47	0.0484	0.0046	0.1865	0.0553	111	0.1143	0.0111	0.2946	0.0521
48	0.0491	0.0049	0.1972	0.0487	112	0.1154	0.0113	0.3176	0.0352
49	0.0500	0.0050	0.2130	0.0295	113	0.1169	0.0114	0.3489	0.0217
50	0.0508	0.0051	0.2047	0.0277	114	0.1182	0.0115	0.3305	0.0257
51	0.0516	0.0053	0.2137	0.0773	115	0.1195	0.0116	0.3242	0.0231
52	0.0525	0.0058	0.2239	0.0699	116	0.1208	0.0117	0.3347	0.0174
53	0.0534	0.0058	0.2418	0.0302	117	0.1222	0.0117	0.3085	0.0147
54	0.0545	0.0060	0.2553	0.0272	118	0.1233	0.0118	0.3056	0.0030
55	0.0554	0.0060	0.2859	0.0066	119	0.1246	0.0118	0.2996	-0.0032
56	0.0568	0.0061	0.2910	0.0044	120	0.1257	0.0117	0.2775	-0.0011
57	0.0578	0.0061	0.2948	0.0003	121	0.1269	0.0117	0.2828	-0.0204
58	0.0591	0.0061	0.3020	-0.0060	122	0.1280	0.0116	0.2629	-0.0312
59	0.0602	0.0060	0.3042	-0.0105	123	0.1290	0.0115	0.2376	-0.0319
60	0.0615	0.0060	0.3101	-0.0149	124	0.1299	0.0113	0.2118	-0.0349
61	0.0627	0.0059	0.3241	-0.0421	125	0.1307	0.0112	0.1939	-0.0393
62	0.0641	0.0056	0.3281	-0.0507	126	0.1314	0.0110	0.1764	-0.0471
63	0.0653	0.0055	0.2692	-0.0453	127	0.1321	0.0108	0.1665	-0.0423
64	0.0663	0.0053	0.2697	-0.0637	128	0.1327	0.0107	0.1607	-0.0433

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.1334	0.0105	0.1672	-0.0350	175	0.1810	0.0151	0.2975	0.0419
130	0.1341	0.0104	0.1759	-0.0351	176	0.1822	0.0152	0.3045	0.0370
131	0.1348	0.0102	0.1802	-0.0379	177	0.1834	0.0154	0.3066	0.0320
132	0.1355	0.0101	0.2010	-0.0309	178	0.1847	0.0155	0.3096	0.0223
133	0.1364	0.0100	0.2178	-0.0282	179	0.1859	0.0155	0.3171	0.0242
134	0.1373	0.0099	0.2303	-0.0212	180	0.1872	0.0157	0.3197	0.0319
135	0.1382	0.0098	0.2504	-0.0198	181	0.1885	0.0158	0.3175	0.0218
136	0.1393	0.0097	0.2799	-0.0161	182	0.1898	0.0158	0.3131	0.0181
137	0.1405	0.0097	0.2910	-0.0052	183	0.1910	0.0159	0.3042	0.0107
138	0.1416	0.0097	0.3000	0.0039	184	0.1922	0.0159	0.2970	0.0047
139	0.1429	0.0097	0.3107	0.0090	185	0.1934	0.0160	0.2962	0.0054
140	0.1441	0.0097	0.3000	0.0178	186	0.1946	0.0160	0.2894	-0.0063
141	0.1453	0.0098	0.2950	0.0364	187	0.1957	0.0159	0.2739	-0.0085
142	0.1464	0.0100	0.2804	0.0498	188	0.1967	0.0159	0.2533	-0.0121
143	0.1475	0.0102	0.2579	0.0489	189	0.1977	0.0158	0.2394	-0.0171
144	0.1485	0.0104	0.2316	0.0469	190	0.1987	0.0158	0.2307	-0.0220
145	0.1494	0.0106	0.2082	0.0516	191	0.1995	0.0157	0.2147	-0.0285
146	0.1502	0.0108	0.2028	0.0577	192	0.2004	0.0155	0.2067	-0.0353
147	0.1510	0.0111	0.2134	0.0494	193	0.2012	0.0154	0.2042	-0.0343
148	0.1519	0.0112	0.2113	0.0414	194	0.2020	0.0152	0.1953	-0.0331
149	0.1527	0.0114	0.2034	0.0509	196	0.2036	0.0149	0.2016	-0.0568
150	0.1535	0.0116	0.2168	0.0539	197	0.2044	0.0147	0.2016	-0.0528
151	0.1544	0.0118	0.2211	0.0450	198	0.2052	0.0145	0.2139	-0.0496
152	0.1553	0.0120	0.2203	0.0373	199	0.2061	0.0143	0.2272	-0.0606
153	0.1562	0.0121	0.2265	0.0379	200	0.2070	0.0140	0.2407	-0.0570
154	0.1571	0.0123	0.2507	0.0380	201	0.2080	0.0138	0.2685	-0.0438
155	0.1582	0.0124	0.2607	0.0405	202	0.2092	0.0136	0.2878	-0.0496
156	0.1592	0.0126	0.2522	0.0330	203	0.2103	0.0134	0.3007	-0.0575
157	0.1602	0.0127	0.2555	0.0277	204	0.2116	0.0132	0.3088	-0.0467
158	0.1612	0.0128	0.2622	0.0311	205	0.2128	0.0130	0.3208	-0.0308
159	0.1623	0.0130	0.2759	0.0265	206	0.2142	0.0129	0.3324	-0.0201
160	0.1634	0.0131	0.2839	0.0317	207	0.2154	0.0129	0.3142	-0.0078
161	0.1646	0.0132	0.2975	0.0360	208	0.2167	0.0129	0.2909	-0.0003
162	0.1658	0.0133	0.2961	0.0382	209	0.2178	0.0129	0.2512	0.0105
163	0.1669	0.0135	0.2903	0.0293	210	0.2187	0.0129	0.2217	0.0156
164	0.1681	0.0136	0.2932	0.0255	211	0.2195	0.0130	0.1975	0.0190
165	0.1693	0.0137	0.2806	0.0314	212	0.2203	0.0131	0.1712	0.0233
166	0.1704	0.0138	0.2860	0.0301	213	0.2209	0.0132	0.1591	0.0350
167	0.1716	0.0140	0.3019	0.0326	214	0.2215	0.0134	0.1651	0.0382
168	0.1728	0.0141	0.3075	0.0298	215	0.2222	0.0135	0.1856	0.0235
169	0.1740	0.0142	0.3021	0.0398	216	0.2230	0.0136	0.1950	0.0227
170	0.1752	0.0144	0.2960	0.0423	217	0.2238	0.0137	0.2029	0.0274
171	0.1764	0.0145	0.2982	0.0257	218	0.2246	0.0138	0.2254	0.0245
172	0.1776	0.0146	0.2891	0.0234	219	0.2256	0.0139	0.2565	0.0310
173	0.1787	0.0147	0.2824	0.0318	220	0.2267	0.0140	0.2731	0.0490
174	0.1798	0.0149	0.2884	0.0427	221	0.2278	0.0143	-	-

Table B2.12 Raw data of free-rising EPS-5.430-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0628	0.0011	0.3152	0.0228
2	0.0012	-0.0002	0.2779	-0.0538	66	0.0641	0.0012	0.3149	0.0213
3	0.0022	-0.0004	0.2578	-0.0433	67	0.0653	0.0013	0.3039	0.0133
4	0.0032	-0.0006	0.2401	-0.0218	68	0.0665	0.0013	0.2873	0.0013
5	0.0041	-0.0006	0.2244	0.0049	69	0.0676	0.0013	0.2670	-0.0030
6	0.0050	-0.0006	0.2151	0.0187	70	0.0687	0.0013	0.2358	0.0041
7	0.0059	-0.0005	0.2105	0.0306	71	0.0695	0.0013	0.1966	-0.0008
8	0.0067	-0.0003	0.1976	0.0391	72	0.0703	0.0013	0.1726	-0.0061
9	0.0074	-0.0001	0.2010	0.0507	73	0.0709	0.0013	0.1675	-0.0074
10	0.0083	0.0001	0.2048	0.0603	74	0.0716	0.0012	0.1747	-0.0038
11	0.0091	0.0003	0.2036	0.0632	75	0.0723	0.0012	0.1833	-0.0010
12	0.0099	0.0006	0.2066	0.0573	76	0.0731	0.0012	0.1958	-0.0028
13	0.0107	0.0008	0.2036	0.0620	77	0.0739	0.0012	0.2055	-0.0032
14	0.0116	0.0011	0.2234	0.0712	78	0.0747	0.0012	0.2173	-0.0067
15	0.0125	0.0014	0.2515	0.0675	79	0.0756	0.0011	0.2428	-0.0095
16	0.0136	0.0016	0.2681	0.0679	80	0.0766	0.0011	0.2633	-0.0079
17	0.0147	0.0019	0.2889	0.0726	81	0.0777	0.0011	0.2680	-0.0108
18	0.0159	0.0022	0.3049	0.0594	82	0.0788	0.0010	0.2627	-0.0311
19	0.0171	0.0024	0.3197	0.0456	83	0.0798	0.0008	0.2778	-0.0321
20	0.0184	0.0026	0.3235	0.0392	84	0.0810	0.0008	0.2806	-0.0232
21	0.0197	0.0027	0.3177	0.0283	85	0.0821	0.0007	0.2763	-0.0254
22	0.0210	0.0028	0.3135	0.0165	86	0.0832	0.0006	0.2903	-0.0339
23	0.0222	0.0028	0.2852	-0.0013	87	0.0844	0.0004	0.2908	-0.0344
24	0.0233	0.0028	0.2571	-0.0106	88	0.0855	0.0003	0.2920	-0.0179
25	0.0243	0.0027	0.2289	-0.0159	89	0.0867	0.0002	0.2908	-0.0152
26	0.0251	0.0027	0.2062	-0.0218	90	0.0879	0.0002	0.2894	-0.0276
27	0.0259	0.0026	0.1867	-0.0305	91	0.0890	0.0000	0.2951	-0.0229
28	0.0266	0.0024	0.1765	-0.0310	92	0.0902	0.0000	0.2967	-0.0106
29	0.0273	0.0023	0.1921	-0.0241	93	0.0914	-0.0001	0.3011	-0.0115
30	0.0281	0.0022	0.2035	-0.0323	94	0.0926	-0.0001	0.3041	-0.0078
31	0.0289	0.0021	0.2032	-0.0363	95	0.0938	-0.0001	0.3140	-0.0037
32	0.0298	0.0019	0.2192	-0.0293	96	0.0952	-0.0001	0.3207	-0.0038
33	0.0307	0.0018	0.2289	-0.0360	97	0.0964	-0.0002	0.3161	-0.0042
34	0.0316	0.0017	0.2276	-0.0394	98	0.0977	-0.0002	0.3147	0.0013
35	0.0325	0.0015	0.2432	-0.0411	99	0.0989	-0.0002	0.3108	0.0090
36	0.0335	0.0013	0.2584	-0.0488	100	0.1002	-0.0001	0.3077	0.0076
37	0.0346	0.0011	0.2638	-0.0507	101	0.1014	-0.0001	0.3059	0.0122
38	0.0356	0.0009	0.2585	-0.0569	102	0.1026	0.0000	0.2982	0.0177
39	0.0367	0.0007	0.2723	-0.0631	103	0.1038	0.0001	0.2927	0.0211
40	0.0378	0.0004	0.2861	-0.0630	104	0.1050	0.0002	0.2821	0.0307
41	0.0389	0.0002	0.2852	-0.0657	105	0.1060	0.0003	0.2622	0.0419
42	0.0401	-0.0001	0.2984	-0.0580	106	0.1071	0.0005	0.2666	0.0528
43	0.0413	-0.0003	0.3069	-0.0547	107	0.1082	0.0007	0.2702	0.0621
44	0.0426	-0.0005	0.3172	-0.0499	108	0.1092	0.0010	0.2521	0.0620
45	0.0439	-0.0007	0.3221	-0.0388	109	0.1102	0.0012	0.2546	0.0573
46	0.0451	-0.0009	0.3030	-0.0305	110	0.1113	0.0015	0.2601	0.0736
47	0.0463	-0.0009	0.2950	-0.0125	111	0.1123	0.0018	0.2597	0.0906
48	0.0475	-0.0010	0.2806	0.0019	112	0.1133	0.0022	0.2636	0.0898
49	0.0485	-0.0009	0.2377	0.0130	113	0.1144	0.0025	0.2660	0.0926
50	0.0494	-0.0009	0.2053	0.0201	114	0.1155	0.0029	0.2611	0.0978
51	0.0502	-0.0008	0.1819	0.0235	115	0.1165	0.0033	0.2684	0.0972
52	0.0509	-0.0007	0.1617	0.0294	116	0.1176	0.0037	0.2947	0.0927
53	0.0515	-0.0005	0.1518	0.0359	117	0.1188	0.0040	0.3088	0.0820
54	0.0521	-0.0004	0.1599	0.0359	118	0.1201	0.0044	0.3218	0.0758
55	0.0528	-0.0002	0.1748	0.0345	119	0.1214	0.0047	0.3150	0.0669
56	0.0535	-0.0001	0.1866	0.0367	120	0.1226	0.0049	0.3119	0.0486
57	0.0542	0.0001	0.2029	0.0376	121	0.1239	0.0050	0.3058	0.0244
58	0.0551	0.0002	0.2095	0.0353	122	0.1250	0.0051	0.2969	-0.0005
59	0.0559	0.0003	0.2292	0.0359	123	0.1263	0.0050	0.2868	-0.0108
60	0.0569	0.0005	0.2599	0.0420	124	0.1273	0.0050	0.2561	-0.0180
61	0.0580	0.0007	0.2776	0.0406	125	0.1283	0.0049	0.2382	-0.0251
62	0.0591	0.0008	0.2949	0.0337	126	0.1292	0.0048	0.2259	-0.0306
63	0.0604	0.0009	0.3058	0.0259	127	0.1301	0.0047	0.2042	-0.0544
64	0.0616	0.0010	0.3082	0.0188	128	0.1309	0.0044	0.1946	-0.0652

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.1317	0.0041	0.1960	-0.0713	172	0.1780	0.0113	0.3036	0.0274
130	0.1324	0.0038	0.1879	-0.0874	173	0.1791	0.0114	0.3021	0.0177
131	0.1332	0.0034	0.1853	-0.0893	174	0.1804	0.0114	0.3074	0.0087
132	0.1339	0.0031	0.1961	-0.0743	175	0.1816	0.0115	0.3029	0.0033
133	0.1348	0.0028	0.2114	-0.0675	176	0.1828	0.0115	0.3051	-0.0039
134	0.1356	0.0025	0.2304	-0.0771	177	0.1840	0.0114	0.3056	-0.0109
135	0.1366	0.0022	0.2428	-0.0836	178	0.1853	0.0114	0.3087	-0.0140
136	0.1376	0.0019	0.2574	-0.0831	179	0.1865	0.0113	0.3113	-0.0236
137	0.1387	0.0016	0.2756	-0.0757	180	0.1878	0.0112	0.3134	-0.0456
138	0.1398	0.0013	0.2895	-0.0755	181	0.1890	0.0110	0.3085	-0.0587
139	0.1410	0.0010	0.3087	-0.0798	182	0.1902	0.0107	0.3052	-0.0724
140	0.1422	0.0006	0.3143	-0.0718	183	0.1915	0.0104	0.3085	-0.0978
141	0.1435	0.0004	0.3312	-0.0465	184	0.1927	0.0099	0.3034	-0.1151
142	0.1449	0.0003	0.3379	-0.0072	185	0.1939	0.0095	0.2954	-0.1259
143	0.1462	0.0003	0.3279	0.0213	186	0.1951	0.0089	0.2891	-0.1307
144	0.1475	0.0004	0.3248	0.0447	187	0.1962	0.0084	0.2734	-0.1336
145	0.1488	0.0007	0.3052	0.0866	188	0.1972	0.0079	0.2536	-0.1482
146	0.1500	0.0011	0.2769	0.1149	189	0.1982	0.0072	0.2329	-0.1446
147	0.1510	0.0016	0.2322	0.1272	190	0.1991	0.0067	0.2271	-0.1453
148	0.1518	0.0021	0.2146	0.1335	191	0.2000	0.0061	0.2210	-0.1445
149	0.1527	0.0027	0.2114	0.1404	192	0.2009	0.0056	0.2093	-0.1200
150	0.1535	0.0033	0.1812	0.1401	193	0.2017	0.0051	0.1991	-0.1097
151	0.1542	0.0038	0.1926	0.1394	194	0.2025	0.0047	0.1941	-0.1124
152	0.1550	0.0044	0.2082	0.1502	195	0.2033	0.0042	0.2008	-0.1128
153	0.1558	0.0050	0.2061	0.1416	196	0.2041	0.0038	0.2057	-0.1021
154	0.1567	0.0055	0.2293	0.1299	197	0.2049	0.0034	0.2064	-0.0969
155	0.1577	0.0060	0.2477	0.1245	198	0.2057	0.0030	0.2133	-0.0852
156	0.1587	0.0065	0.2529	0.1201	199	0.2066	0.0027	0.2202	-0.0640
157	0.1597	0.0070	0.2644	0.1197	200	0.2075	0.0025	0.2295	-0.0550
158	0.1608	0.0075	0.2723	0.1208	201	0.2085	0.0023	0.2488	-0.0421
159	0.1619	0.0080	0.2834	0.1145	202	0.2095	0.0021	0.2643	-0.0328
160	0.1631	0.0084	0.2942	0.1019	203	0.2106	0.0020	0.2926	-0.0234
161	0.1642	0.0088	0.3019	0.0952	204	0.2118	0.0020	0.3160	-0.0057
162	0.1655	0.0091	0.3105	0.0897	205	0.2131	0.0020	0.3248	0.0076
163	0.1667	0.0095	0.3067	0.0870	206	0.2144	0.0020	0.3089	0.0240
164	0.1679	0.0098	0.3112	0.0811	207	0.2156	0.0022	0.3054	0.0354
165	0.1692	0.0101	0.3111	0.0708	208	0.2169	0.0023	0.2779	0.0567
166	0.1704	0.0104	0.3105	0.0566	209	0.2178	0.0026	0.2408	0.0741
167	0.1717	0.0106	0.3146	0.0498	210	0.2188	0.0029	0.2254	0.0753
168	0.1729	0.0108	0.3162	0.0449	211	0.2196	0.0032	0.2036	0.0851
169	0.1742	0.0109	0.3133	0.0372	212	0.2204	0.0036	0.1889	0.0878
170	0.1754	0.0111	0.3130	0.0298	213	0.2211	0.0039	-	-
171	0.1767	0.0112	0.3176	0.0255					

Table B2.13 Raw data of free-rising EPS-6.197-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0730	0.0007	0.3020	-0.0633
2	0.0011	0.0003	0.2977	0.0837	66	0.0742	0.0004	0.2846	-0.0725
3	0.0024	0.0007	0.3161	0.0747	67	0.0753	0.0002	0.2766	-0.0693
4	0.0037	0.0009	0.3281	0.0567	68	0.0764	-0.0001	0.2466	-0.0652
5	0.0050	0.0011	0.3377	0.0474	69	0.0773	-0.0004	0.2334	-0.0712
6	0.0064	0.0013	0.3356	0.0245	70	0.0783	-0.0007	0.2383	-0.0681
7	0.0077	0.0013	0.3485	-0.0028	71	0.0792	-0.0009	0.2261	-0.0545
8	0.0091	0.0013	0.3519	-0.0274	72	0.0801	-0.0011	0.2418	-0.0617
9	0.0105	0.0011	0.3446	-0.0506	73	0.0811	-0.0014	0.2525	-0.0554
10	0.0119	0.0009	0.3348	-0.0714	74	0.0821	-0.0016	0.2490	-0.0424
11	0.0132	0.0005	0.3160	-0.1075	75	0.0831	-0.0017	0.2645	-0.0425
12	0.0144	0.0000	0.2971	-0.1298	76	0.0842	-0.0019	0.2788	-0.0434
13	0.0156	-0.0005	0.2821	-0.1428	77	0.0853	-0.0021	0.2804	-0.0440
14	0.0167	-0.0011	0.2629	-0.1605	78	0.0865	-0.0022	0.2912	-0.0243
15	0.0177	-0.0018	0.2367	-0.1579	79	0.0877	-0.0023	0.3004	-0.0193
16	0.0186	-0.0024	0.2062	-0.1490	80	0.0889	-0.0024	0.3091	-0.0195
17	0.0193	-0.0030	0.1981	-0.1436	81	0.0901	-0.0024	0.3219	-0.0018
18	0.0202	-0.0035	0.2033	-0.1408	82	0.0915	-0.0024	0.3189	0.0053
19	0.0209	-0.0041	0.1912	-0.1352	83	0.0927	-0.0024	0.3224	0.0127
20	0.0217	-0.0046	0.2056	-0.1200	84	0.0940	-0.0023	0.3235	0.0333
21	0.0226	-0.0051	0.2472	-0.1213	85	0.0953	-0.0021	0.3317	0.0512
22	0.0237	-0.0056	0.2484	-0.1164	86	0.0967	-0.0019	0.3353	0.0544
23	0.0246	-0.0060	0.2453	-0.1171	87	0.0979	-0.0017	0.3206	0.0716
24	0.0256	-0.0065	0.2675	-0.1131	88	0.0993	-0.0013	0.3233	0.0972
25	0.0267	-0.0069	0.2867	-0.1066	89	0.1005	-0.0009	0.3176	0.1053
26	0.0279	-0.0074	0.3015	-0.1017	90	0.1018	-0.0005	0.3127	0.1152
27	0.0291	-0.0077	0.3221	-0.0949	91	0.1030	0.0000	0.2864	0.1283
28	0.0305	-0.0081	0.3348	-0.0846	92	0.1041	0.0005	0.3107	0.1297
29	0.0318	-0.0084	0.3311	-0.0580	93	0.1055	0.0010	0.3298	0.1346
30	0.0332	-0.0086	0.3584	-0.0536	94	0.1067	0.0016	0.3090	0.1468
31	0.0347	-0.0088	0.3863	-0.0499	95	0.1080	0.0022	0.2920	0.1341
32	0.0362	-0.0090	0.3785	-0.0234	96	0.1091	0.0027	0.2857	0.1316
33	0.0377	-0.0090	0.3543	0.0145	97	0.1103	0.0033	0.2985	0.1343
34	0.0391	-0.0089	0.3380	0.0381	98	0.1114	0.0038	0.3077	0.1165
35	0.0404	-0.0087	0.3261	0.0601	99	0.1127	0.0042	0.3106	0.1070
36	0.0417	-0.0084	0.3258	0.0889	100	0.1139	0.0046	0.3173	0.0983
37	0.0430	-0.0080	0.2960	0.1219	101	0.1153	0.0050	0.3127	0.0882
38	0.0441	-0.0074	0.2557	0.1301	102	0.1164	0.0053	0.3332	0.0786
39	0.0451	-0.0070	0.2454	0.1190	103	0.1179	0.0056	0.3554	0.0603
40	0.0460	-0.0065	0.2186	0.1286	104	0.1193	0.0058	0.3523	0.0506
41	0.0468	-0.0059	0.2000	0.1206	105	0.1208	0.0060	0.3534	0.0321
42	0.0476	-0.0055	0.1905	0.1203	106	0.1221	0.0061	0.3414	-0.0039
43	0.0483	-0.0050	0.1947	0.1102	107	0.1235	0.0060	0.3513	-0.0152
44	0.0492	-0.0046	0.2066	0.0968	108	0.1249	0.0059	0.3241	-0.0416
45	0.0500	-0.0042	0.2043	0.0955	109	0.1261	0.0056	0.2934	-0.0736
46	0.0508	-0.0039	0.2039	0.0932	110	0.1273	0.0054	0.2994	-0.0953
47	0.0516	-0.0034	0.2018	0.0983	111	0.1285	0.0049	0.2827	-0.1209
48	0.0524	-0.0031	0.2142	0.0987	112	0.1295	0.0044	0.2548	-0.1300
49	0.0533	-0.0027	0.2339	0.1089	113	0.1305	0.0038	0.2364	-0.1491
50	0.0543	-0.0022	0.2437	0.1129	114	0.1314	0.0032	0.2038	-0.1636
51	0.0553	-0.0018	0.2678	0.1070	115	0.1322	0.0025	0.1759	-0.1574
52	0.0564	-0.0013	0.2840	0.1087	116	0.1328	0.0019	0.1650	-0.1297
53	0.0575	-0.0009	0.2845	0.1049	117	0.1335	0.0015	0.1357	-0.1109
54	0.0587	-0.0005	0.2917	0.0987	118	0.1339	0.0010	0.1466	-0.0902
55	0.0599	-0.0001	0.2977	0.0944	119	0.1346	0.0008	0.1806	-0.0806
56	0.0611	0.0002	0.3082	0.0871	120	0.1353	0.0004	0.1958	-0.0824
57	0.0623	0.0006	0.3202	0.0768	121	0.1362	0.0001	0.2251	-0.0731
58	0.0637	0.0009	0.3394	0.0475	122	0.1371	-0.0002	0.2259	-0.0803
59	0.0651	0.0010	0.3511	0.0259	123	0.1380	-0.0005	0.2363	-0.0832
60	0.0665	0.0011	0.3440	0.0180	124	0.1390	-0.0009	0.2756	-0.0889
61	0.0678	0.0011	0.3388	0.0102	125	0.1402	-0.0012	0.2875	-0.0964
62	0.0692	0.0012	0.3414	-0.0059	126	0.1413	-0.0016	0.2996	-0.0943
63	0.0705	0.0011	0.3266	-0.0248	127	0.1426	-0.0020	0.3240	-0.0919
64	0.0718	0.0010	0.3084	-0.0434	128	0.1439	-0.0024	0.3271	-0.0908

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.1452	-0.0027	0.3272	-0.0894	166	0.1917	0.0069	0.3784	0.0605
130	0.1465	-0.0031	0.3357	-0.0746	167	0.1932	0.0071	0.3843	0.0382
131	0.1479	-0.0033	0.3149	-0.0518	168	0.1948	0.0072	0.4036	0.0168
132	0.1491	-0.0035	0.3326	-0.0442	169	0.1964	0.0072	0.3718	-0.0102
133	0.1506	-0.0037	0.3651	-0.0420	170	0.1978	0.0071	0.3636	-0.0405
134	0.1520	-0.0038	0.3420	-0.0259	171	0.1993	0.0069	0.3616	-0.0779
135	0.1533	-0.0039	0.3243	-0.0112	172	0.2007	0.0065	0.3090	-0.0970
136	0.1546	-0.0039	0.3353	-0.0080	173	0.2018	0.0061	0.2867	-0.1113
137	0.1560	-0.0039	0.3555	-0.0031	174	0.2030	0.0056	0.2542	-0.1285
138	0.1574	-0.0039	0.3371	-0.0004	175	0.2038	0.0051	0.1964	-0.1267
139	0.1587	-0.0039	0.3465	0.0077	176	0.2045	0.0046	0.1693	-0.1130
140	0.1602	-0.0039	0.3538	0.0322	177	0.2052	0.0042	0.1598	-0.0876
141	0.1615	-0.0037	0.3469	0.0454	178	0.2058	0.0039	0.1722	-0.0823
142	0.1630	-0.0035	0.3523	0.0397	179	0.2066	0.0036	0.1960	-0.0729
143	0.1643	-0.0034	0.3553	0.0523	180	0.2074	0.0033	0.2080	-0.0660
144	0.1658	-0.0031	0.3359	0.0679	181	0.2082	0.0030	0.2316	-0.0802
145	0.1670	-0.0028	0.3212	0.0669	182	0.2092	0.0027	0.2422	-0.0837
146	0.1684	-0.0026	0.3286	0.0819	183	0.2102	0.0024	0.2448	-0.0784
147	0.1697	-0.0022	0.3220	0.0948	184	0.2112	0.0020	0.2670	-0.0908
148	0.1710	-0.0018	0.3277	0.1034	185	0.2123	0.0016	0.2666	-0.1035
149	0.1723	-0.0013	0.3091	0.1177	186	0.2133	0.0012	0.2650	-0.1109
150	0.1734	-0.0009	0.2875	0.1280	187	0.2144	0.0007	0.2739	-0.1146
151	0.1746	-0.0003	0.3026	0.1255	188	0.2155	0.0003	0.2725	-0.1143
152	0.1759	0.0001	0.2884	0.1225	189	0.2166	-0.0002	0.2786	-0.1148
153	0.1769	0.0007	0.2554	0.1463	190	0.2177	-0.0006	0.2901	-0.1178
154	0.1779	0.0013	0.2734	0.1457	191	0.2189	-0.0011	0.3054	-0.1223
155	0.1791	0.0018	0.2728	0.1320	192	0.2202	-0.0016	0.3122	-0.1142
156	0.1801	0.0024	0.2418	0.1445	193	0.2214	-0.0020	0.3313	-0.1043
157	0.1810	0.0030	0.2440	0.1429	194	0.2228	-0.0024	0.3332	-0.0933
158	0.1820	0.0035	0.2556	0.1318	195	0.2241	-0.0028	0.3302	-0.0891
159	0.1831	0.0040	0.2510	0.1297	196	0.2255	-0.0031	0.3591	-0.0852
160	0.1840	0.0046	0.2614	0.1200	197	0.2270	-0.0035	0.3580	-0.0678
161	0.1852	0.0050	0.2753	0.1146	198	0.2283	-0.0037	0.3702	-0.0586
162	0.1862	0.0055	0.2969	0.1075	199	0.2299	-0.0039	0.3554	-0.0612
163	0.1875	0.0059	0.3100	0.0987	200	0.2312	-0.0042	0.3542	-0.0321
164	0.1887	0.0063	0.3292	0.0960	201	0.2328	-0.0042	0.3785	0.0008
165	0.1902	0.0066	0.3756	0.0803	202	0.2342	-0.0042	-	-

Table B2.14 Raw data of free-rising EPS-S-4.192-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0511	0.0001	0.2017	-0.0147
2	0.0009	0.0001	0.2085	0.0420	66	0.0519	0.0000	0.1989	-0.0168
3	0.0017	0.0003	0.2124	0.0487	67	0.0527	-0.0001	0.1969	-0.0324
4	0.0026	0.0005	0.2059	0.0433	68	0.0535	-0.0002	0.1990	-0.0448
5	0.0033	0.0007	0.2151	0.0381	69	0.0543	-0.0004	0.1894	-0.0405
6	0.0043	0.0008	0.2194	0.0311	70	0.0550	-0.0006	0.1631	-0.0367
7	0.0051	0.0009	0.1875	0.0490	71	0.0556	-0.0007	0.1641	-0.0359
8	0.0058	0.0012	0.1898	0.0459	72	0.0563	-0.0008	0.1853	-0.0339
9	0.0066	0.0013	0.2017	0.0367	73	0.0571	-0.0010	0.1759	-0.0338
10	0.0074	0.0015	0.2180	0.0282	74	0.0577	-0.0011	0.1671	-0.0284
11	0.0083	0.0015	0.2239	0.0205	75	0.0584	-0.0012	0.1797	-0.0361
12	0.0092	0.0016	0.2042	0.0190	76	0.0592	-0.0014	0.1796	-0.0410
13	0.0100	0.0017	0.1917	0.0257	77	0.0599	-0.0016	0.1788	-0.0286
14	0.0107	0.0018	0.1999	0.0275	78	0.0606	-0.0016	0.1844	-0.0314
15	0.0116	0.0019	0.2150	0.0111	79	0.0614	-0.0018	0.1929	-0.0334
16	0.0124	0.0019	0.2159	0.0033	80	0.0622	-0.0019	0.2025	-0.0131
17	0.0133	0.0019	0.2104	-0.0016	81	0.0630	-0.0019	0.2118	-0.0022
18	0.0141	0.0019	0.2082	-0.0067	82	0.0638	-0.0019	0.2149	-0.0024
19	0.0150	0.0019	0.2080	-0.0082	83	0.0647	-0.0019	0.2093	-0.0004
20	0.0158	0.0018	0.2020	-0.0097	84	0.0655	-0.0019	0.2120	0.0032
21	0.0166	0.0018	0.1972	-0.0111	85	0.0664	-0.0019	0.2091	0.0054
22	0.0174	0.0017	0.2059	-0.0216	86	0.0672	-0.0019	0.1961	0.0079
23	0.0182	0.0016	0.2040	-0.0383	87	0.0680	-0.0018	0.1948	0.0064
24	0.0190	0.0014	0.1864	-0.0378	88	0.0688	-0.0018	0.1938	0.0062
25	0.0197	0.0013	0.1854	-0.0286	89	0.0695	-0.0018	0.1719	0.0099
26	0.0205	0.0012	0.1964	-0.0368	90	0.0701	-0.0017	0.1658	0.0118
27	0.0213	0.0010	0.1767	-0.0444	91	0.0708	-0.0017	0.1880	0.0045
28	0.0219	0.0009	0.1577	-0.0320	92	0.0716	-0.0017	0.1898	0.0075
29	0.0225	0.0008	0.1701	-0.0314	93	0.0724	-0.0016	0.1731	0.0097
30	0.0233	0.0006	0.1735	-0.0306	94	0.0730	-0.0016	0.1767	0.0055
31	0.0239	0.0005	0.1755	-0.0298	95	0.0738	-0.0016	0.1897	0.0237
32	0.0247	0.0004	0.1726	-0.0395	96	0.0745	-0.0014	0.2013	0.0292
33	0.0253	0.0002	0.1652	-0.0327	97	0.0754	-0.0014	0.2156	0.0141
34	0.0260	0.0001	0.1784	-0.0237	98	0.0763	-0.0013	0.2051	0.0055
35	0.0267	0.0000	0.1926	-0.0312	99	0.0770	-0.0013	0.2022	0.0000
36	0.0275	-0.0001	0.1977	-0.0350	100	0.0779	-0.0013	0.2132	-0.0023
37	0.0283	-0.0003	0.2064	-0.0203	101	0.0787	-0.0013	0.2107	-0.0023
38	0.0292	-0.0003	0.2147	-0.0107	102	0.0796	-0.0013	0.2094	-0.0040
39	0.0300	-0.0003	0.2138	-0.0061	103	0.0804	-0.0014	0.2076	-0.0044
40	0.0309	-0.0004	0.2148	0.0038	104	0.0812	-0.0014	0.1985	-0.0009
41	0.0318	-0.0003	0.2111	0.0065	105	0.0820	-0.0014	0.2027	-0.0064
42	0.0326	-0.0003	0.2045	0.0057	106	0.0828	-0.0014	0.2144	-0.0176
43	0.0334	-0.0003	0.2075	0.0071	107	0.0837	-0.0015	0.2096	-0.0196
44	0.0342	-0.0002	0.2049	0.0089	108	0.0845	-0.0016	0.2012	-0.0224
45	0.0350	-0.0002	0.1952	0.0043	109	0.0853	-0.0017	0.2018	-0.0331
46	0.0358	-0.0002	0.1957	0.0056	110	0.0861	-0.0019	0.1996	-0.0341
47	0.0366	-0.0002	0.2020	0.0098	111	0.0869	-0.0020	0.1857	-0.0213
48	0.0374	-0.0001	0.2058	0.0076	112	0.0876	-0.0020	0.1736	-0.0212
49	0.0382	-0.0001	0.1986	0.0116	113	0.0883	-0.0021	0.1698	-0.0333
50	0.0390	0.0000	0.1781	0.0088	114	0.0890	-0.0023	0.1728	-0.0375
51	0.0397	0.0000	0.1786	0.0050	115	0.0897	-0.0024	0.1725	-0.0350
52	0.0404	0.0000	0.1957	0.0030	116	0.0904	-0.0026	0.1754	-0.0326
53	0.0412	0.0000	0.2019	0.0007	117	0.0911	-0.0027	0.1797	-0.0246
54	0.0420	0.0000	0.1956	0.0009	118	0.0918	-0.0028	0.1882	-0.0157
55	0.0428	0.0000	0.1990	0.0025	119	0.0926	-0.0028	0.1882	-0.0203
56	0.0436	0.0000	0.2064	0.0125	120	0.0933	-0.0029	0.1862	-0.0319
57	0.0445	0.0001	0.2106	0.0164	121	0.0941	-0.0031	0.1959	-0.0278
58	0.0453	0.0002	0.2143	0.0107	122	0.0949	-0.0032	0.2074	-0.0115
59	0.0462	0.0002	0.2137	0.0061	123	0.0957	-0.0032	0.2074	-0.0061
60	0.0470	0.0002	0.2142	0.0018	124	0.0965	-0.0032	0.2019	-0.0058
61	0.0479	0.0002	0.2110	-0.0017	125	0.0974	-0.0032	0.2054	0.0014
62	0.0487	0.0002	0.2035	-0.0012	126	0.0982	-0.0032	0.2056	0.0068
63	0.0495	0.0002	0.2006	-0.0063	127	0.0990	-0.0032	0.2035	0.0096
64	0.0503	0.0001	0.2035	-0.0172	128	0.0998	-0.0031	0.2020	0.0119

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.1006	-0.0031	0.1984	0.0076	195	0.1520	-0.0032	0.1888	-0.0193
130	0.1014	-0.0031	0.1942	0.0095	196	0.1527	-0.0033	0.1512	-0.0446
131	0.1022	-0.0030	0.1947	0.0120	197	0.1532	-0.0035	0.1474	-0.0411
132	0.1029	-0.0030	0.1842	0.0198	198	0.1539	-0.0036	0.1692	-0.0172
133	0.1036	-0.0028	0.1680	0.0317	199	0.1546	-0.0037	0.1746	-0.0101
134	0.1043	-0.0027	0.1764	0.0278	200	0.1553	-0.0037	0.1564	-0.0207
135	0.1051	-0.0026	0.1893	0.0192	201	0.1558	-0.0038	0.1706	-0.0245
136	0.1058	-0.0026	0.1753	0.0218	202	0.1566	-0.0039	0.1939	-0.0189
137	0.1065	-0.0024	0.1787	0.0324	203	0.1574	-0.0040	0.1819	-0.0274
138	0.1072	-0.0023	0.1938	0.0319	204	0.1581	-0.0041	0.1748	-0.0340
139	0.1080	-0.0022	0.1930	0.0182	205	0.1588	-0.0043	0.1851	-0.0260
140	0.1088	-0.0021	0.2020	0.0095	206	0.1596	-0.0043	0.1972	-0.0118
141	0.1096	-0.0021	0.2104	0.0088	207	0.1604	-0.0043	0.2028	-0.0050
142	0.1105	-0.0021	0.2088	-0.0003	208	0.1612	-0.0044	0.2085	-0.0009
143	0.1113	-0.0021	0.2121	-0.0063	209	0.1620	-0.0044	0.2070	0.0023
144	0.1122	-0.0021	0.2147	-0.0043	210	0.1629	-0.0043	0.2040	0.0042
145	0.1130	-0.0021	0.2101	-0.0055	211	0.1637	-0.0043	0.2009	0.0053
146	0.1138	-0.0022	0.2066	-0.0060	212	0.1645	-0.0043	0.2053	0.0079
147	0.1147	-0.0022	0.2002	-0.0051	213	0.1653	-0.0043	0.2057	0.0095
148	0.1154	-0.0022	0.2091	-0.0081	214	0.1661	-0.0042	0.1928	0.0132
149	0.1163	-0.0023	0.2090	-0.0078	215	0.1669	-0.0042	0.1773	0.0202
150	0.1171	-0.0023	0.1999	-0.0190	216	0.1675	-0.0041	0.1811	0.0325
151	0.1179	-0.0024	0.1975	-0.0210	217	0.1683	-0.0039	0.1865	0.0347
152	0.1187	-0.0024	0.1914	-0.0250	218	0.1690	-0.0038	0.1715	0.0219
153	0.1195	-0.0026	0.1935	-0.0352	219	0.1697	-0.0037	0.1689	0.0145
154	0.1202	-0.0027	0.1861	-0.0260	220	0.1704	-0.0037	0.1659	0.0219
155	0.1210	-0.0028	0.1639	-0.0180	221	0.1710	-0.0035	0.1813	0.0211
156	0.1216	-0.0029	0.1655	-0.0341	222	0.1718	-0.0035	0.2132	0.0266
157	0.1223	-0.0031	0.1700	-0.0430	223	0.1727	-0.0033	0.2113	0.0302
158	0.1229	-0.0032	0.1866	-0.0309	224	0.1735	-0.0033	0.1888	0.0262
159	0.1238	-0.0033	0.1937	-0.0353	225	0.1742	-0.0031	0.1842	0.0264
160	0.1245	-0.0035	0.1811	-0.0282	226	0.1750	-0.0030	0.1936	0.0127
161	0.1252	-0.0036	0.1947	-0.0164	227	0.1758	-0.0030	0.1973	0.0041
162	0.1260	-0.0036	0.1915	-0.0141	228	0.1766	-0.0030	0.2020	0.0011
163	0.1268	-0.0037	0.1880	-0.0040	229	0.1774	-0.0030	0.2069	-0.0011
164	0.1275	-0.0037	0.1887	-0.0051	230	0.1782	-0.0030	0.2082	-0.0039
165	0.1283	-0.0037	0.1950	-0.0241	231	0.1790	-0.0030	0.2084	-0.0053
166	0.1291	-0.0038	0.2054	-0.0260	232	0.1799	-0.0031	0.2069	-0.0058
167	0.1299	-0.0039	0.2083	-0.0096	233	0.1807	-0.0031	0.2039	-0.0056
168	0.1308	-0.0039	0.2075	0.0006	234	0.1815	-0.0031	0.2036	-0.0067
169	0.1316	-0.0039	0.2054	0.0043	235	0.1823	-0.0031	0.2105	-0.0146
170	0.1324	-0.0039	0.2037	0.0080	236	0.1832	-0.0032	0.2003	-0.0249
171	0.1332	-0.0038	0.2056	0.0088	237	0.1839	-0.0033	0.1855	-0.0404
172	0.1340	-0.0038	0.2039	0.0070	238	0.1847	-0.0035	0.1802	-0.0319
173	0.1348	-0.0038	0.1893	0.0111	239	0.1854	-0.0036	0.1714	-0.0131
174	0.1356	-0.0037	0.1819	0.0136	240	0.1861	-0.0037	0.1790	-0.0105
175	0.1363	-0.0037	0.1796	0.0202	241	0.1868	-0.0037	0.1764	-0.0195
176	0.1370	-0.0036	0.1751	0.0269	242	0.1875	-0.0038	0.1630	-0.0381
177	0.1377	-0.0035	0.1809	0.0241	243	0.1881	-0.0040	0.1676	-0.0322
178	0.1384	-0.0034	0.1916	0.0212	244	0.1888	-0.0041	0.1933	-0.0151
179	0.1392	-0.0033	0.1833	0.0157	245	0.1897	-0.0041	0.2165	-0.0214
180	0.1399	-0.0033	0.1811	0.0293	246	0.1905	-0.0042	0.2093	-0.0227
181	0.1407	-0.0031	0.1939	0.0312	247	0.1913	-0.0043	0.2052	-0.0134
182	0.1415	-0.0030	0.2013	0.0127	248	0.1922	-0.0043	0.2113	-0.0100
183	0.1423	-0.0030	0.1998	0.0060	249	0.1930	-0.0044	0.2095	-0.0039
184	0.1431	-0.0030	0.1990	0.0011	250	0.1939	-0.0044	0.2094	-0.0006
185	0.1439	-0.0030	0.2044	0.0000	251	0.1947	-0.0044	0.2083	0.0025
186	0.1447	-0.0030	0.2084	0.0015	252	0.1955	-0.0044	0.2077	0.0047
187	0.1455	-0.0029	0.2108	-0.0011	253	0.1964	-0.0043	0.2080	0.0073
188	0.1464	-0.0030	0.2099	-0.0058	254	0.1972	-0.0043	0.1953	0.0040
189	0.1472	-0.0030	0.2084	-0.0066	255	0.1979	-0.0043	0.1984	0.0052
190	0.1480	-0.0030	0.2083	-0.0065	256	0.1988	-0.0043	0.2085	0.0093
191	0.1489	-0.0030	0.2062	-0.0008	257	0.1996	-0.0042	0.1946	0.0109
192	0.1497	-0.0030	0.1985	-0.0037	258	0.2003	-0.0042	0.1970	0.0245
193	0.1505	-0.0031	0.1874	-0.0137	259	0.2012	-0.0040	0.1974	0.0354
194	0.1512	-0.0031	0.1955	-0.0124	260	0.2019	-0.0039	0.1873	0.0303

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
261	0.2027	-0.0038	0.1728	0.0186	269	0.2088	-0.0034	0.2121	0.0015
262	0.2033	-0.0037	0.1709	0.0116	270	0.2096	-0.0034	0.2041	-0.0038
263	0.2040	-0.0037	0.1855	0.0087	271	0.2104	-0.0034	0.2020	-0.0040
264	0.2048	-0.0037	0.1779	0.0152	272	0.2112	-0.0034	0.2026	-0.0070
265	0.2055	-0.0036	0.1739	0.0190	273	0.2121	-0.0035	0.2071	-0.0098
266	0.2062	-0.0035	0.2011	0.0124	274	0.2129	-0.0035	0.2079	-0.0127
267	0.2071	-0.0035	0.2162	0.0111	275	0.2137	-0.0036	0.1980	-0.0071
268	0.2079	-0.0034	0.2168	0.0104	276	0.2145	-0.0036	-	-

Table B2.15 Raw data of free-rising EPS-S-5.503-FW in FW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0579	-0.0011	0.2455	-0.0442
2	0.0008	-0.0003	0.2306	-0.0710	66	0.0589	-0.0013	0.2454	-0.0366
3	0.0018	-0.0006	0.2312	-0.0670	67	0.0599	-0.0014	0.2631	-0.0200
4	0.0027	-0.0008	0.2239	-0.0604	68	0.0610	-0.0015	0.2639	-0.0188
5	0.0036	-0.0011	0.2371	-0.0620	69	0.0620	-0.0016	0.2510	-0.0111
6	0.0046	-0.0013	0.2479	-0.0613	70	0.0630	-0.0016	0.2518	0.0000
7	0.0056	-0.0015	0.2537	-0.0488	71	0.0640	-0.0016	0.2527	0.0085
8	0.0066	-0.0017	0.2439	-0.0318	72	0.0650	-0.0015	0.2448	0.0252
9	0.0076	-0.0018	0.2460	-0.0278	73	0.0660	-0.0014	0.2321	0.0477
10	0.0086	-0.0019	0.2510	-0.0232	74	0.0669	-0.0011	0.2219	0.0545
11	0.0096	-0.0020	0.2589	-0.0153	75	0.0677	-0.0009	0.2204	0.0507
12	0.0107	-0.0020	0.2627	-0.0071	76	0.0686	-0.0007	0.1945	0.0599
13	0.0117	-0.0020	0.2491	0.0049	77	0.0693	-0.0004	0.1849	0.0701
14	0.0126	-0.0020	0.2562	0.0179	78	0.0701	-0.0002	0.2016	0.0695
15	0.0137	-0.0019	0.2616	0.0260	79	0.0709	0.0001	0.1916	0.0706
16	0.0147	-0.0018	0.2430	0.0446	80	0.0716	0.0004	0.1779	0.0739
17	0.0157	-0.0015	0.2274	0.0652	81	0.0723	0.0007	0.1847	0.0693
18	0.0166	-0.0013	0.2168	0.0710	82	0.0731	0.0010	0.1914	0.0686
19	0.0174	-0.0010	0.2171	0.0746	83	0.0739	0.0012	0.1889	0.0711
20	0.0183	-0.0007	0.2031	0.0756	84	0.0746	0.0015	0.1989	0.0636
21	0.0190	-0.0004	0.1932	0.0807	85	0.0755	0.0018	0.2084	0.0629
22	0.0198	0.0000	0.1979	0.0846	86	0.0763	0.0020	0.2066	0.0738
23	0.0206	0.0003	0.1913	0.0841	87	0.0771	0.0023	0.2131	0.0648
24	0.0214	0.0006	0.1982	0.0888	88	0.0780	0.0025	0.2121	0.0578
25	0.0222	0.0010	0.1991	0.0897	89	0.0788	0.0028	0.2181	0.0675
26	0.0230	0.0014	0.1999	0.0775	90	0.0797	0.0031	0.2223	0.0544
27	0.0238	0.0016	0.1986	0.0817	91	0.0806	0.0032	0.2220	0.0457
28	0.0246	0.0020	0.2003	0.0889	92	0.0815	0.0035	0.2360	0.0494
29	0.0254	0.0024	0.2041	0.0908	93	0.0825	0.0036	0.2435	0.0515
30	0.0262	0.0027	0.2045	0.0851	94	0.0835	0.0039	0.2478	0.0422
31	0.0270	0.0030	0.2245	0.0715	95	0.0845	0.0040	0.2507	0.0294
32	0.0280	0.0033	0.2213	0.0770	96	0.0855	0.0041	0.2615	0.0267
33	0.0288	0.0037	0.2225	0.0750	97	0.0865	0.0042	0.2623	0.0143
34	0.0298	0.0039	0.2331	0.0584	98	0.0876	0.0042	0.2510	0.0089
35	0.0307	0.0041	0.2276	0.0498	99	0.0886	0.0043	0.2653	0.0013
36	0.0316	0.0043	0.2405	0.0493	100	0.0897	0.0042	0.2688	-0.0135
37	0.0326	0.0045	0.2582	0.0426	101	0.0907	0.0042	0.2480	-0.0190
38	0.0336	0.0047	0.2627	0.0294	102	0.0917	0.0041	0.2504	-0.0226
39	0.0347	0.0047	0.2578	0.0255	103	0.0927	0.0040	0.2465	-0.0276
40	0.0357	0.0049	0.2607	0.0182	104	0.0936	0.0039	0.2478	-0.0472
41	0.0368	0.0049	0.2653	-0.0039	105	0.0947	0.0036	0.2475	-0.0641
42	0.0378	0.0048	0.2513	-0.0131	106	0.0956	0.0033	0.2182	-0.0631
43	0.0388	0.0048	0.2517	-0.0237	107	0.0964	0.0031	0.2125	-0.0764
44	0.0398	0.0046	0.2523	-0.0524	108	0.0973	0.0027	0.2188	-0.0748
45	0.0408	0.0044	0.2429	-0.0562	109	0.0982	0.0025	0.2018	-0.0647
46	0.0418	0.0042	0.2196	-0.0544	110	0.0989	0.0022	0.2002	-0.0792
47	0.0426	0.0039	0.1983	-0.0661	111	0.0998	0.0019	0.2100	-0.0746
48	0.0434	0.0037	0.2062	-0.0749	112	0.1006	0.0016	0.1952	-0.0664
49	0.0442	0.0033	0.1868	-0.0760	113	0.1013	0.0013	0.2071	-0.0772
50	0.0449	0.0030	0.1883	-0.0860	114	0.1023	0.0010	0.2142	-0.0788
51	0.0457	0.0026	0.2046	-0.0899	115	0.1031	0.0007	0.1967	-0.0731
52	0.0465	0.0023	0.1911	-0.0806	116	0.1038	0.0004	0.2176	-0.0699
53	0.0473	0.0020	0.1999	-0.0769	117	0.1048	0.0001	0.2187	-0.0693
54	0.0481	0.0017	0.2130	-0.0790	118	0.1056	-0.0001	0.2040	-0.0653
55	0.0490	0.0014	0.2021	-0.0915	119	0.1064	-0.0004	0.2197	-0.0663
56	0.0497	0.0010	0.2120	-0.0816	120	0.1074	-0.0007	0.2197	-0.0655
57	0.0507	0.0007	0.2229	-0.0707	121	0.1082	-0.0009	0.2155	-0.0553
58	0.0515	0.0004	0.2118	-0.0722	122	0.1091	-0.0011	0.2166	-0.0569
59	0.0523	0.0001	0.2227	-0.0652	123	0.1099	-0.0014	0.2353	-0.0599
60	0.0533	-0.0001	0.2308	-0.0622	124	0.1110	-0.0016	0.2520	-0.0554
61	0.0542	-0.0004	0.2188	-0.0628	125	0.1119	-0.0018	0.2413	-0.0402
62	0.0550	-0.0006	0.2276	-0.0566	126	0.1129	-0.0019	0.2421	-0.0416
63	0.0560	-0.0008	0.2328	-0.0459	127	0.1139	-0.0021	0.2422	-0.0403
64	0.0569	-0.0010	0.2376	-0.0390	128	0.1148	-0.0022	0.2536	-0.0236

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.1159	-0.0023	0.2675	-0.0269	188	0.1684	-0.0020	0.2356	-0.0287
130	0.1170	-0.0025	0.2679	-0.0192	189	0.1692	-0.0021	0.2289	-0.0142
131	0.1180	-0.0025	0.2621	-0.0080	190	0.1702	-0.0022	0.2502	-0.0005
132	0.1191	-0.0025	0.2601	-0.0047	191	0.1712	-0.0021	0.2564	0.0041
133	0.1201	-0.0025	0.2616	0.0079	192	0.1722	-0.0021	0.2522	0.0105
134	0.1212	-0.0025	0.2601	0.0200	193	0.1733	-0.0021	0.2438	0.0139
135	0.1222	-0.0024	0.2378	0.0198	194	0.1742	-0.0020	0.2292	0.0197
136	0.1231	-0.0023	0.2233	0.0265	195	0.1751	-0.0019	0.2320	0.0246
137	0.1240	-0.0021	0.2490	0.0435	196	0.1760	-0.0018	0.2260	0.0373
138	0.1251	-0.0019	0.2322	0.0413	197	0.1769	-0.0016	0.2095	0.0474
139	0.1259	-0.0018	0.2002	0.0463	198	0.1777	-0.0014	0.1966	0.0516
140	0.1267	-0.0016	0.2011	0.0600	199	0.1785	-0.0012	0.1924	0.0533
141	0.1275	-0.0013	0.2068	0.0623	200	0.1793	-0.0010	0.1893	0.0498
142	0.1283	-0.0011	0.1982	0.0534	201	0.1800	-0.0008	0.1747	0.0499
143	0.1290	-0.0009	0.1863	0.0521	202	0.1807	-0.0006	0.1672	0.0511
144	0.1298	-0.0007	0.2041	0.0582	203	0.1813	-0.0004	0.1799	0.0515
145	0.1307	-0.0004	0.2035	0.0555	204	0.1821	-0.0002	0.1834	0.0436
146	0.1314	-0.0002	0.1931	0.0529	205	0.1828	0.0000	0.1841	0.0420
147	0.1322	0.0000	0.1987	0.0496	206	0.1836	0.0001	0.1936	0.0406
148	0.1330	0.0002	0.2034	0.0492	207	0.1843	0.0003	0.1969	0.0404
149	0.1339	0.0004	0.2068	0.0557	208	0.1851	0.0005	0.2093	0.0421
150	0.1347	0.0006	0.2060	0.0627	209	0.1860	0.0006	0.2142	0.0405
151	0.1355	0.0009	0.2064	0.0504	210	0.1869	0.0008	0.2143	0.0317
152	0.1363	0.0010	0.2179	0.0404	211	0.1877	0.0009	0.2199	0.0219
153	0.1372	0.0012	0.2209	0.0487	212	0.1886	0.0010	0.2337	0.0285
154	0.1381	0.0014	0.2144	0.0433	213	0.1896	0.0011	0.2482	0.0311
155	0.1390	0.0015	0.2171	0.0367	214	0.1906	0.0012	0.2386	0.0237
156	0.1398	0.0017	0.2263	0.0402	215	0.1915	0.0013	0.2385	0.0162
157	0.1408	0.0019	0.2373	0.0417	216	0.1925	0.0013	0.2568	0.0044
158	0.1417	0.0020	0.2450	0.0312	217	0.1936	0.0013	0.2651	-0.0033
159	0.1427	0.0021	0.2557	0.0182	218	0.1946	0.0013	0.2615	-0.0087
160	0.1438	0.0022	0.2579	0.0122	219	0.1957	0.0013	0.2514	-0.0111
161	0.1448	0.0022	0.2543	-0.0036	220	0.1966	0.0012	0.2554	-0.0137
162	0.1458	0.0022	0.2575	-0.0035	221	0.1977	0.0012	0.2498	-0.0162
163	0.1469	0.0022	0.2660	-0.0036	222	0.1986	0.0011	0.2461	-0.0254
164	0.1479	0.0021	0.2608	-0.0155	223	0.1997	0.0009	0.2412	-0.0437
165	0.1489	0.0021	0.2469	-0.0148	224	0.2006	0.0007	0.2124	-0.0536
166	0.1499	0.0020	0.2554	-0.0194	225	0.2014	0.0005	0.1941	-0.0576
167	0.1510	0.0019	0.2465	-0.0308	226	0.2021	0.0003	0.1968	-0.0484
168	0.1519	0.0018	0.2242	-0.0420	227	0.2029	0.0001	0.1948	-0.0450
169	0.1528	0.0016	0.2133	-0.0515	228	0.2037	-0.0001	0.1809	-0.0550
170	0.1536	0.0014	0.1995	-0.0571	229	0.2044	-0.0003	0.1864	-0.0537
171	0.1544	0.0011	0.1907	-0.0492	230	0.2052	-0.0005	0.1861	-0.0490
172	0.1551	0.0010	0.1889	-0.0526	231	0.2059	-0.0007	0.1768	-0.0475
173	0.1559	0.0007	0.1889	-0.0616	232	0.2066	-0.0009	0.1865	-0.0371
174	0.1566	0.0005	0.1902	-0.0539	233	0.2074	-0.0010	0.1896	-0.0362
175	0.1574	0.0003	0.1863	-0.0560	234	0.2081	-0.0012	0.1902	-0.0406
176	0.1581	0.0000	0.1739	-0.0599	235	0.2089	-0.0013	0.2094	-0.0364
177	0.1588	-0.0002	0.1767	-0.0574	236	0.2098	-0.0015	0.2202	-0.0416
178	0.1595	-0.0004	0.1902	-0.0532	237	0.2106	-0.0017	0.2177	-0.0407
179	0.1603	-0.0006	0.2099	-0.0529	238	0.2115	-0.0018	0.2227	-0.0340
180	0.1612	-0.0009	0.2083	-0.0499	239	0.2124	-0.0019	0.2287	-0.0337
181	0.1620	-0.0010	0.1999	-0.0491	240	0.2133	-0.0021	0.2206	-0.0298
182	0.1628	-0.0013	0.2127	-0.0490	241	0.2142	-0.0022	0.2244	-0.0286
183	0.1637	-0.0014	0.2284	-0.0396	242	0.2151	-0.0023	0.2392	-0.0326
184	0.1646	-0.0016	0.2306	-0.0410	243	0.2161	-0.0024	0.2352	-0.0239
185	0.1655	-0.0018	0.2187	-0.0334	244	0.2170	-0.0025	0.2418	-0.0167
186	0.1664	-0.0018	0.2279	-0.0184	245	0.2180	-0.0026	0.2575	-0.0137
187	0.1674	-0.0019	0.2464	-0.0254	246	0.2191	-0.0026	-	-

Appendix B3. Raw data of free-rising spheres in SW

Table B3.1 Raw data of free-rising PP-2.030-SW in SW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	61	0.0178	-0.0002	0.0737	0.0102
2	0.0003	0.0000	0.0779	0.0025	62	0.0182	-0.0001	0.0707	0.0229
3	0.0006	0.0000	0.0594	0.0015	63	0.0184	0.0000	0.0531	0.0204
4	0.0008	0.0000	0.0772	-0.0069	64	0.0186	0.0000	0.0709	0.0043
5	0.0012	0.0000	0.0774	-0.0026	65	0.0189	0.0000	0.0693	0.0030
6	0.0014	0.0000	0.0718	0.0024	66	0.0192	0.0001	0.0723	0.0038
7	0.0018	0.0000	0.0743	-0.0033	67	0.0195	0.0001	0.0701	0.0062
8	0.0020	-0.0001	0.0704	-0.0106	68	0.0197	0.0001	0.0601	0.0056
9	0.0024	-0.0001	0.0822	-0.0045	69	0.0200	0.0001	0.0727	0.0006
10	0.0027	-0.0001	0.0822	0.0048	70	0.0203	0.0001	0.0629	0.0186
11	0.0030	-0.0001	0.0737	0.0004	71	0.0205	0.0003	0.0771	0.0285
12	0.0033	-0.0001	0.0665	-0.0131	72	0.0209	0.0003	0.0739	0.0186
13	0.0036	-0.0002	0.0830	0.0014	73	0.0211	0.0004	0.0618	0.0094
14	0.0039	-0.0001	0.0839	-0.0103	74	0.0214	0.0004	0.0678	0.0045
15	0.0042	-0.0002	0.0846	-0.0209	75	0.0216	0.0004	0.0639	0.0037
16	0.0046	-0.0002	0.0884	-0.0138	76	0.0219	0.0004	0.0784	0.0015
17	0.0049	-0.0004	0.0775	-0.0171	77	0.0222	0.0004	0.0710	-0.0009
18	0.0052	-0.0004	0.0750	-0.0055	78	0.0225	0.0004	0.0751	0.0030
19	0.0055	-0.0004	0.0698	-0.0038	79	0.0228	0.0005	0.0705	0.0037
20	0.0058	-0.0004	0.0708	-0.0026	80	0.0230	0.0005	0.0772	-0.0030
21	0.0061	-0.0004	0.0749	-0.0014	81	0.0235	0.0004	0.0737	-0.0038
22	0.0064	-0.0004	0.0758	-0.0067	82	0.0236	0.0004	0.0524	-0.0011
23	0.0067	-0.0005	0.0803	0.0039	83	0.0239	0.0004	0.0730	-0.0042
24	0.0070	-0.0004	0.0758	0.0063	84	0.0242	0.0004	0.0692	-0.0049
25	0.0073	-0.0004	0.0719	-0.0042	85	0.0244	0.0004	0.0807	-0.0029
26	0.0076	-0.0004	0.0755	0.0010	86	0.0249	0.0004	0.0775	-0.0001
27	0.0079	-0.0004	0.0705	-0.0024	87	0.0251	0.0004	0.0617	0.0065
28	0.0082	-0.0004	0.0703	0.0008	88	0.0254	0.0004	0.0739	-0.0022
29	0.0085	-0.0004	0.0708	0.0035	89	0.0256	0.0004	0.0760	-0.0061
30	0.0087	-0.0004	0.0702	-0.0037	90	0.0260	0.0004	0.0748	-0.0039
31	0.0091	-0.0004	0.0789	-0.0046	91	0.0262	0.0004	0.0621	0.0026
32	0.0094	-0.0005	0.0743	-0.0025	92	0.0265	0.0004	0.0663	-0.0005
33	0.0096	-0.0005	0.0786	0.0033	93	0.0268	0.0003	0.0673	-0.0128
34	0.0100	-0.0004	0.0796	-0.0029	94	0.0270	0.0003	0.0699	-0.0009
35	0.0103	-0.0005	0.0776	-0.0004	95	0.0273	0.0003	0.0745	-0.0113
36	0.0106	-0.0004	0.0689	0.0035	96	0.0276	0.0002	0.0669	-0.0164
37	0.0108	-0.0005	0.0705	0.0041	97	0.0279	0.0002	0.0748	0.0102
38	0.0112	-0.0004	0.0693	0.0015	98	0.0282	0.0003	0.0789	0.0022
39	0.0114	-0.0004	0.0673	0.0000	99	0.0285	0.0002	0.0714	-0.0233
40	0.0117	-0.0004	0.0824	0.0022	100	0.0288	0.0001	0.0712	-0.0200
41	0.0121	-0.0004	0.0739	-0.0061	101	0.0291	0.0001	0.0678	-0.0118
42	0.0123	-0.0005	0.0714	0.0046	102	0.0293	0.0000	0.0740	-0.0097
43	0.0126	-0.0004	0.0662	0.0026	103	0.0297	0.0000	0.0789	-0.0057
44	0.0128	-0.0004	0.0587	0.0009	104	0.0299	0.0000	0.0701	-0.0069
45	0.0131	-0.0004	0.0787	0.0029	105	0.0302	-0.0001	0.0602	-0.0022
46	0.0135	-0.0004	0.0746	-0.0003	106	0.0304	-0.0001	0.0674	-0.0030
47	0.0137	-0.0004	0.0793	0.0083	107	0.0308	-0.0001	0.0688	-0.0077
48	0.0141	-0.0003	0.0842	0.0053	108	0.0310	-0.0001	0.0732	-0.0121
49	0.0144	-0.0003	0.0769	-0.0019	109	0.0314	-0.0002	0.0764	-0.0046
50	0.0147	-0.0004	0.0763	-0.0030	110	0.0316	-0.0002	0.0653	-0.0212
51	0.0150	-0.0004	0.0771	0.0031	111	0.0319	-0.0004	0.0740	-0.0203
52	0.0153	-0.0003	0.0748	0.0022	112	0.0322	-0.0003	0.0704	-0.0013
53	0.0156	-0.0004	0.0523	0.0072	113	0.0324	-0.0004	0.0704	-0.0202
54	0.0158	-0.0003	0.0630	-0.0020	114	0.0327	-0.0005	0.0659	-0.0106
55	0.0161	-0.0004	0.0791	-0.0029	115	0.0330	-0.0005	0.0719	-0.0009
56	0.0164	-0.0003	0.0827	0.0059	116	0.0333	-0.0005	0.0807	-0.0013
57	0.0167	-0.0003	0.0777	0.0138	117	0.0336	-0.0005	0.0671	0.0014
58	0.0170	-0.0002	0.0585	0.0154	118	0.0339	-0.0005	0.0707	-0.0035
59	0.0172	-0.0002	0.0714	-0.0030	119	0.0342	-0.0005	0.0697	0.0011
60	0.0176	-0.0002	0.0732	0.0008	120	0.0344	-0.0005	0.0653	0.0016

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
121	0.0347	-0.0005	0.0761	-0.0014	187	0.0534	-0.0003	0.0635	-0.0003
122	0.0350	-0.0005	0.0697	-0.0054	188	0.0537	-0.0003	0.0746	-0.0014
123	0.0353	-0.0005	0.0656	-0.0148	189	0.0540	-0.0003	0.0713	-0.0002
124	0.0355	-0.0006	0.0681	-0.0185	190	0.0542	-0.0003	0.0784	-0.0026
125	0.0358	-0.0007	0.0631	-0.0171	191	0.0546	-0.0003	0.0738	-0.0023
126	0.0361	-0.0007	0.0680	0.0007	192	0.0548	-0.0003	0.0681	0.0024
127	0.0363	-0.0007	0.0704	-0.0116	193	0.0552	-0.0003	0.0668	-0.0038
128	0.0366	-0.0008	0.0692	-0.0077	194	0.0554	-0.0003	0.0669	-0.0002
129	0.0369	-0.0007	0.0657	0.0058	195	0.0557	-0.0003	0.0724	-0.0005
130	0.0371	-0.0008	0.0757	-0.0066	196	0.0560	-0.0003	0.0651	0.0028
131	0.0375	-0.0008	0.0780	0.0042	197	0.0562	-0.0003	0.0676	0.0010
132	0.0378	-0.0007	0.0685	-0.0070	198	0.0565	-0.0003	0.0649	-0.0049
133	0.0381	-0.0008	0.0732	-0.0003	199	0.0567	-0.0003	0.0763	0.0047
134	0.0384	-0.0007	0.0717	0.0073	200	0.0571	-0.0003	0.0732	-0.0030
135	0.0386	-0.0008	0.0706	0.0038	201	0.0573	-0.0003	0.0588	-0.0007
136	0.0389	-0.0007	0.0663	0.0041	202	0.0576	-0.0003	0.0671	0.0036
137	0.0392	-0.0007	0.0611	-0.0057	203	0.0579	-0.0003	0.0659	-0.0050
138	0.0394	-0.0008	0.0766	-0.0003	204	0.0581	-0.0003	0.0699	-0.0013
139	0.0398	-0.0007	0.0757	-0.0007	205	0.0584	-0.0003	0.0713	-0.0018
140	0.0400	-0.0008	0.0675	0.0067	206	0.0587	-0.0003	0.0684	0.0036
141	0.0403	-0.0007	0.0663	0.0030	207	0.0590	-0.0003	0.0809	-0.0025
142	0.0405	-0.0007	0.0660	-0.0053	208	0.0593	-0.0004	0.0784	-0.0015
143	0.0408	-0.0007	0.0717	0.0065	209	0.0596	-0.0003	0.0707	0.0111
144	0.0411	-0.0007	0.0700	0.0035	210	0.0599	-0.0003	0.0577	-0.0013
145	0.0414	-0.0007	0.0813	-0.0010	211	0.0601	-0.0003	0.0611	-0.0063
146	0.0418	-0.0007	0.0780	0.0044	212	0.0604	-0.0003	0.0780	-0.0066
147	0.0420	-0.0007	0.0722	0.0051	213	0.0607	-0.0004	0.0738	-0.0008
148	0.0423	-0.0007	0.0660	0.0040	214	0.0610	-0.0003	0.0761	0.0076
149	0.0425	-0.0006	0.0612	-0.0008	215	0.0613	-0.0003	0.0734	0.0025
150	0.0428	-0.0007	0.0768	-0.0048	216	0.0616	-0.0003	0.0652	0.0035
151	0.0432	-0.0007	0.0729	0.0030	217	0.0618	-0.0003	0.0656	-0.0021
152	0.0434	-0.0006	0.0797	0.0065	218	0.0621	-0.0003	0.0703	-0.0004
153	0.0438	-0.0006	0.0750	0.0001	219	0.0624	-0.0003	0.0745	0.0062
154	0.0440	-0.0006	0.0651	-0.0009	220	0.0627	-0.0003	0.0706	0.0012
155	0.0443	-0.0006	0.0686	-0.0005	221	0.0629	-0.0003	0.0725	0.0010
156	0.0446	-0.0006	0.0636	-0.0012	222	0.0633	-0.0003	0.0659	-0.0056
157	0.0448	-0.0006	0.0800	0.0006	223	0.0635	-0.0003	0.0658	0.0001
158	0.0452	-0.0006	0.0742	0.0008	224	0.0638	-0.0003	0.0745	0.0042
159	0.0454	-0.0006	0.0745	0.0001	225	0.0641	-0.0003	0.0697	0.0032
160	0.0458	-0.0006	0.0753	0.0025	226	0.0643	-0.0002	0.0774	-0.0031
161	0.0460	-0.0006	0.0773	0.0052	227	0.0647	-0.0003	0.0795	0.0013
162	0.0464	-0.0006	0.0713	-0.0035	228	0.0650	-0.0002	0.0695	0.0052
163	0.0466	-0.0006	0.0531	-0.0028	229	0.0652	-0.0003	0.0657	-0.0048
164	0.0468	-0.0006	0.0780	0.0027	230	0.0655	-0.0003	0.0645	0.0027
165	0.0472	-0.0006	0.0843	0.0056	231	0.0658	-0.0002	0.0759	0.0001
166	0.0475	-0.0006	0.0776	-0.0034	232	0.0661	-0.0003	0.0772	-0.0011
167	0.0478	-0.0006	0.0683	-0.0011	233	0.0664	-0.0003	0.0775	0.0005
168	0.0481	-0.0006	0.0554	0.0069	234	0.0667	-0.0003	0.0785	-0.0002
169	0.0483	-0.0006	0.0754	0.0073	235	0.0670	-0.0003	0.0617	0.0066
170	0.0487	-0.0005	0.0739	0.0013	236	0.0672	-0.0002	0.0650	0.0034
171	0.0489	-0.0006	0.0721	0.0077	237	0.0675	-0.0002	0.0720	-0.0036
172	0.0492	-0.0005	0.0712	0.0236	238	0.0678	-0.0002	0.0746	-0.0022
173	0.0494	-0.0004	0.0710	0.0049	239	0.0681	-0.0002	0.0775	0.0021
174	0.0498	-0.0004	0.0667	0.0052	240	0.0684	-0.0002	0.0651	0.0056
175	0.0500	-0.0004	0.0513	0.0084	241	0.0686	-0.0002	0.0687	0.0116
176	0.0502	-0.0004	0.0763	0.0039	242	0.0690	-0.0001	0.0696	0.0207
177	0.0506	-0.0003	0.0761	0.0037	243	0.0692	0.0000	0.0714	0.0197
178	0.0508	-0.0003	0.0843	-0.0014	244	0.0695	0.0000	0.0700	0.0129
179	0.0513	-0.0003	0.0753	0.0045	245	0.0698	0.0001	0.0675	0.0068
180	0.0514	-0.0003	0.0677	0.0065	246	0.0701	0.0001	0.0793	0.0082
181	0.0518	-0.0003	0.0709	0.0035	247	0.0704	0.0001	0.0682	0.0097
182	0.0520	-0.0003	0.0588	-0.0001	248	0.0706	0.0002	0.0699	-0.0003
183	0.0523	-0.0003	0.0770	-0.0035	249	0.0709	0.0001	0.0631	0.0032
184	0.0526	-0.0003	0.0701	0.0072	250	0.0711	0.0002	0.0636	0.0159
185	0.0528	-0.0002	0.0694	0.0029	251	0.0715	0.0003	0.0769	0.0237
186	0.0532	-0.0003	0.0698	-0.0075	252	0.0717	0.0004	0.0707	0.0155

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
253	0.0720	0.0004	0.0673	0.0018	288	0.0820	0.0011	0.0584	-0.0008
254	0.0723	0.0004	0.0676	0.0047	289	0.0823	0.0011	0.0732	-0.0091
255	0.0726	0.0004	0.0703	0.0035	290	0.0826	0.0011	0.0831	-0.0029
256	0.0728	0.0004	0.0664	0.0121	291	0.0830	0.0011	0.0815	0.0028
257	0.0731	0.0005	0.0614	0.0175	292	0.0833	0.0011	0.0739	0.0021
258	0.0733	0.0006	0.0710	0.0232	293	0.0836	0.0011	0.0711	0.0007
259	0.0737	0.0007	0.0675	0.0238	294	0.0838	0.0011	0.0638	-0.0062
260	0.0739	0.0008	0.0721	0.0046	295	0.0841	0.0011	0.0717	0.0052
261	0.0742	0.0007	0.0753	0.0064	296	0.0844	0.0011	0.0759	0.0027
262	0.0745	0.0008	0.0815	0.0107	297	0.0847	0.0011	0.0659	0.0002
263	0.0749	0.0008	0.0775	0.0021	298	0.0849	0.0011	0.0725	0.0012
264	0.0751	0.0008	0.0540	0.0059	299	0.0853	0.0011	0.0755	-0.0041
265	0.0753	0.0009	0.0665	0.0164	300	0.0855	0.0011	0.0675	-0.0055
266	0.0756	0.0009	0.0716	0.0139	301	0.0858	0.0011	0.0647	-0.0004
267	0.0759	0.0010	0.0817	0.0088	302	0.0861	0.0011	0.0713	0.0008
268	0.0763	0.0010	0.0731	0.0116	303	0.0864	0.0011	0.0760	-0.0025
269	0.0765	0.0011	0.0608	0.0120	304	0.0867	0.0011	0.0815	0.0034
270	0.0768	0.0011	0.0674	0.0023	305	0.0870	0.0011	0.0767	0.0002
271	0.0770	0.0011	0.0660	-0.0043	306	0.0873	0.0011	0.0622	0.0004
272	0.0773	0.0011	0.0769	-0.0006	307	0.0875	0.0011	0.0667	-0.0006
273	0.0776	0.0011	0.0701	0.0031	308	0.0878	0.0011	0.0732	-0.0035
274	0.0779	0.0011	0.0744	-0.0035	309	0.0881	0.0011	0.0765	0.0014
275	0.0782	0.0011	0.0885	0.0025	310	0.0884	0.0011	0.0734	-0.0016
276	0.0786	0.0011	0.0822	0.0058	311	0.0887	0.0011	0.0694	0.0005
277	0.0789	0.0011	0.0745	-0.0010	312	0.0890	0.0011	0.0791	0.0027
278	0.0792	0.0011	0.0599	0.0069	313	0.0893	0.0011	0.0753	0.0029
279	0.0794	0.0012	0.0671	0.0035	314	0.0896	0.0011	0.0688	-0.0051
280	0.0797	0.0011	0.0745	-0.0083	315	0.0899	0.0011	0.0670	-0.0043
281	0.0800	0.0011	0.0799	0.0002	316	0.0901	0.0011	0.0650	0.0028
282	0.0803	0.0011	0.0790	0.0057	317	0.0904	0.0011	0.0777	-0.0014
283	0.0806	0.0011	0.0695	-0.0032	318	0.0907	0.0011	0.0826	0.0061
284	0.0809	0.0011	0.0792	-0.0055	319	0.0910	0.0011	0.0792	-0.0052
285	0.0812	0.0011	0.0774	0.0005	320	0.0914	0.0010	0.0766	-0.0055
286	0.0815	0.0011	0.0756	0.0062	321	0.0917	0.0011	0.0694	0.0061
287	0.0818	0.0012	0.0655	0.0012	322	0.0919	0.0011	-	-

Table B3.2 Raw data of free-rising PP-2.474-SW in SW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0220	-0.0004	0.0849	0.0041
2	0.0003	0.0001	0.0849	0.0123	66	0.0223	-0.0004	0.0900	0.0020
3	0.0007	0.0001	0.0855	-0.0138	67	0.0228	-0.0004	0.0919	0.0112
4	0.0010	0.0000	0.0868	-0.0022	68	0.0231	-0.0003	0.0887	-0.0016
5	0.0014	0.0001	0.0852	0.0017	69	0.0235	-0.0004	0.0835	-0.0058
6	0.0017	0.0001	0.0824	-0.0176	70	0.0237	-0.0003	0.0916	0.0045
7	0.0020	-0.0001	0.0868	-0.0121	71	0.0242	-0.0003	0.0902	-0.0002
8	0.0024	0.0000	0.0935	0.0020	72	0.0245	-0.0003	0.0814	-0.0064
9	0.0028	0.0000	0.0889	-0.0006	73	0.0248	-0.0004	0.0851	0.0010
10	0.0031	-0.0001	0.0854	0.0069	74	0.0251	-0.0003	0.0951	0.0017
11	0.0035	0.0000	0.0855	0.0017	75	0.0256	-0.0004	0.0913	0.0039
12	0.0038	0.0000	0.0877	-0.0140	76	0.0259	-0.0003	0.0864	0.0054
13	0.0042	-0.0001	0.0929	-0.0063	77	0.0263	-0.0003	0.0898	-0.0054
14	0.0045	-0.0001	0.0839	-0.0023	78	0.0266	-0.0003	0.0898	-0.0058
15	0.0048	-0.0001	0.0869	-0.0008	79	0.0270	-0.0004	0.0899	0.0005
16	0.0052	-0.0001	0.0846	0.0011	80	0.0273	-0.0003	0.0884	0.0029
17	0.0055	-0.0001	0.0918	0.0003	81	0.0277	-0.0004	0.0861	0.0016
18	0.0059	-0.0001	0.0916	-0.0082	82	0.0280	-0.0003	0.0864	0.0018
19	0.0062	-0.0002	0.0858	-0.0016	83	0.0284	-0.0003	0.0881	0.0002
20	0.0066	-0.0001	0.0813	0.0080	84	0.0287	-0.0003	0.0840	0.0012
21	0.0069	-0.0001	0.0851	-0.0076	85	0.0291	-0.0003	0.0815	-0.0014
22	0.0073	-0.0002	0.0933	-0.0006	86	0.0294	-0.0003	0.0886	0.0000
23	0.0076	-0.0001	0.0882	0.0027	87	0.0298	-0.0003	0.0949	0.0028
24	0.0080	-0.0001	0.0763	-0.0030	88	0.0301	-0.0003	0.0908	-0.0008
25	0.0083	-0.0001	0.0892	0.0046	89	0.0305	-0.0003	0.0806	-0.0097
26	0.0087	-0.0001	0.0968	-0.0010	90	0.0308	-0.0004	0.0862	0.0020
27	0.0090	-0.0001	0.0815	-0.0162	91	0.0312	-0.0003	0.0969	0.0117
28	0.0094	-0.0002	0.0744	0.0012	92	0.0315	-0.0003	0.0907	0.0001
29	0.0096	-0.0001	0.0782	-0.0057	93	0.0319	-0.0003	0.0835	0.0026
30	0.0100	-0.0003	0.0818	-0.0083	94	0.0322	-0.0003	0.0883	-0.0076
31	0.0103	-0.0002	0.0744	-0.0082	95	0.0326	-0.0004	0.0909	-0.0107
32	0.0106	-0.0003	0.0758	-0.0236	96	0.0329	-0.0004	0.0831	0.0088
33	0.0109	-0.0004	0.0836	-0.0069	97	0.0333	-0.0003	0.0858	0.0064
34	0.0113	-0.0004	0.0810	0.0032	98	0.0336	-0.0003	0.0955	0.0016
35	0.0115	-0.0004	0.0798	0.0037	99	0.0341	-0.0003	0.0967	-0.0068
36	0.0119	-0.0004	0.0889	-0.0002	100	0.0344	-0.0004	0.0833	-0.0012
37	0.0122	-0.0004	0.0848	-0.0070	101	0.0347	-0.0003	0.0848	-0.0004
38	0.0126	-0.0004	0.0891	-0.0040	102	0.0351	-0.0004	0.0871	0.0015
39	0.0130	-0.0004	0.0922	0.0028	103	0.0354	-0.0003	0.0937	0.0023
40	0.0133	-0.0004	0.0849	-0.0034	104	0.0358	-0.0004	0.0852	-0.0063
41	0.0136	-0.0004	0.0853	0.0001	105	0.0361	-0.0003	0.0892	0.0014
42	0.0140	-0.0004	0.0901	0.0077	106	0.0365	-0.0003	0.0879	0.0148
43	0.0144	-0.0004	0.0862	-0.0030	107	0.0368	-0.0002	0.0898	-0.0012
44	0.0147	-0.0004	0.0865	-0.0063	108	0.0372	-0.0003	0.0913	-0.0047
45	0.0150	-0.0004	0.0810	0.0025	109	0.0376	-0.0003	0.0879	0.0010
46	0.0153	-0.0004	0.0878	0.0073	110	0.0380	-0.0003	0.0875	-0.0059
47	0.0158	-0.0004	0.0872	-0.0049	111	0.0383	-0.0003	0.0882	0.0055
48	0.0160	-0.0004	0.0872	-0.0025	112	0.0387	-0.0003	0.0828	0.0110
49	0.0164	-0.0004	0.0891	0.0084	113	0.0389	-0.0002	0.0873	-0.0044
50	0.0167	-0.0004	0.0891	0.0037	114	0.0394	-0.0003	0.0917	-0.0024
51	0.0172	-0.0003	0.0900	0.0033	115	0.0396	-0.0002	0.0973	0.0110
52	0.0175	-0.0004	0.0804	0.0040	116	0.0401	-0.0002	0.0883	0.0000
53	0.0178	-0.0003	0.0864	0.0012	117	0.0404	-0.0002	0.0851	0.0000
54	0.0181	-0.0003	0.0917	-0.0063	118	0.0408	-0.0002	0.0858	-0.0002
55	0.0185	-0.0004	0.0880	-0.0004	119	0.0410	-0.0002	0.0844	-0.0095
56	0.0189	-0.0003	0.0883	0.0049	120	0.0415	-0.0003	0.0899	-0.0022
57	0.0192	-0.0003	0.0867	-0.0032	121	0.0418	-0.0003	0.0854	0.0102
58	0.0195	-0.0004	0.0860	-0.0054	122	0.0422	-0.0002	0.0899	0.0034
59	0.0199	-0.0004	0.0870	0.0087	123	0.0425	-0.0002	0.0859	-0.0036
60	0.0202	-0.0003	0.0917	0.0025	124	0.0429	-0.0003	0.0861	-0.0001
61	0.0207	-0.0004	0.0913	-0.0013	125	0.0432	-0.0002	0.0897	0.0024
62	0.0210	-0.0003	0.0865	0.0016	126	0.0436	-0.0002	0.0984	0.0062
63	0.0214	-0.0003	0.0851	-0.0124	127	0.0440	-0.0002	0.0897	-0.0013
64	0.0217	-0.0004	0.0845	-0.0046	128	0.0443	-0.0003	0.0845	-0.0041

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0446	-0.0002	0.0853	0.0075	195	0.0689	-0.0001	0.0884	-0.0012
130	0.0450	-0.0002	0.0935	0.0051	196	0.0693	-0.0001	0.0796	-0.0079
131	0.0454	-0.0002	0.0846	-0.0055	197	0.0695	-0.0002	0.0886	-0.0068
132	0.0457	-0.0002	0.0827	-0.0072	198	0.0700	-0.0002	0.0946	-0.0129
133	0.0460	-0.0002	0.0917	0.0028	199	0.0703	-0.0003	0.0920	0.0111
134	0.0464	-0.0002	0.0935	0.0107	200	0.0707	-0.0001	0.0970	0.0218
135	0.0468	-0.0002	0.0858	0.0079	201	0.0711	-0.0001	0.1019	-0.0049
136	0.0471	-0.0002	0.0906	-0.0017	202	0.0715	-0.0001	0.1114	0.0007
137	0.0475	-0.0002	0.0877	0.0003	203	0.0719	-0.0001	0.0920	0.0035
138	0.0478	-0.0002	0.0856	0.0111	204	0.0723	-0.0001	0.0945	-0.0039
139	0.0482	-0.0001	0.0914	0.0187	205	0.0727	-0.0001	0.0986	-0.0025
140	0.0485	0.0000	0.0900	-0.0054	206	0.0730	-0.0001	0.0865	0.0022
141	0.0489	-0.0001	0.0908	-0.0007	207	0.0734	-0.0001	0.0837	0.0016
142	0.0492	0.0000	0.0894	0.0031	208	0.0737	-0.0001	0.0911	0.0033
143	0.0496	-0.0001	0.0821	0.0056	209	0.0741	-0.0001	0.0970	-0.0027
144	0.0499	0.0000	0.0861	0.0034	210	0.0745	-0.0001	0.0966	-0.0029
145	0.0503	-0.0001	0.0931	-0.0024	211	0.0749	-0.0001	0.0894	-0.0063
146	0.0506	0.0000	0.0875	0.0015	212	0.0752	-0.0002	0.0874	-0.0035
147	0.0510	-0.0001	0.0888	-0.0019	213	0.0756	-0.0001	0.0864	0.0041
148	0.0513	0.0000	0.0885	0.0008	214	0.0759	-0.0001	0.0832	0.0031
149	0.0517	0.0000	0.1005	0.0180	215	0.0763	-0.0001	0.0922	-0.0030
150	0.0522	0.0001	0.0904	-0.0012	216	0.0766	-0.0001	0.0929	-0.0056
151	0.0525	-0.0001	0.0875	-0.0059	217	0.0770	-0.0002	0.0856	0.0024
152	0.0529	0.0001	0.0972	0.0039	218	0.0773	-0.0001	0.0818	0.0100
153	0.0532	0.0000	0.1078	-0.0175	219	0.0777	-0.0001	0.0896	0.0007
154	0.0537	0.0000	0.0917	0.0015	220	0.0780	-0.0001	0.0904	-0.0060
155	0.0540	0.0000	0.0934	-0.0032	221	0.0784	-0.0001	0.0883	0.0016
156	0.0545	-0.0001	0.0969	-0.0042	222	0.0787	-0.0001	0.0887	0.0012
157	0.0547	0.0000	0.0866	-0.0010	223	0.0791	-0.0001	0.0860	-0.0028
158	0.0552	-0.0001	0.0950	0.0018	224	0.0794	-0.0001	0.0875	0.0002
159	0.0555	0.0000	0.0922	0.0022	225	0.0798	-0.0001	0.0974	0.0200
160	0.0559	-0.0001	0.0931	0.0011	226	0.0802	0.0000	0.0925	0.0133
161	0.0562	0.0000	0.0909	0.0000	227	0.0805	0.0000	0.0982	-0.0122
162	0.0566	-0.0001	0.0857	0.0012	228	0.0810	-0.0001	0.1060	-0.0062
163	0.0569	0.0000	0.0925	-0.0026	229	0.0814	-0.0001	0.1008	-0.0013
164	0.0574	-0.0001	0.1061	0.0075	230	0.0818	-0.0001	0.0955	-0.0045
165	0.0578	0.0000	0.0918	0.0043	231	0.0821	-0.0001	0.0925	-0.0039
166	0.0581	0.0000	0.0942	-0.0088	232	0.0825	-0.0001	0.0917	-0.0021
167	0.0585	0.0000	0.1035	-0.0016	233	0.0829	-0.0001	0.0911	0.0063
168	0.0589	-0.0001	0.1033	-0.0018	234	0.0833	-0.0001	0.0909	-0.0022
169	0.0594	0.0000	0.0884	-0.0020	235	0.0836	-0.0001	0.0874	-0.0054
170	0.0596	-0.0001	0.0945	-0.0046	236	0.0840	-0.0001	0.1001	0.0151
171	0.0601	-0.0001	0.0987	-0.0027	237	0.0844	0.0000	0.0922	-0.0016
172	0.0604	-0.0001	0.0871	-0.0008	238	0.0847	-0.0001	0.0895	-0.0034
173	0.0608	-0.0001	0.0847	0.0025	239	0.0851	0.0000	0.1037	0.0129
174	0.0611	-0.0001	0.0916	0.0020	240	0.0855	0.0000	0.1077	-0.0041
175	0.0615	-0.0001	0.0916	-0.0016	241	0.0860	-0.0001	0.0922	-0.0048
176	0.0618	-0.0001	0.0897	-0.0059	242	0.0863	-0.0001	0.0860	-0.0035
177	0.0623	-0.0001	0.0917	-0.0043	243	0.0867	-0.0001	0.1001	-0.0054
178	0.0626	-0.0001	0.0841	0.0044	244	0.0871	-0.0001	0.1030	0.0012
179	0.0629	-0.0001	0.0988	0.0115	245	0.0875	-0.0001	0.0860	-0.0009
180	0.0634	0.0000	0.0984	0.0065	246	0.0878	-0.0001	0.0864	-0.0027
181	0.0637	0.0000	0.0941	-0.0078	247	0.0882	-0.0001	0.0973	-0.0048
182	0.0641	-0.0001	0.0989	-0.0031	248	0.0885	-0.0001	0.0913	-0.0018
183	0.0645	-0.0001	0.1071	0.0003	249	0.0889	-0.0001	0.0870	-0.0004
184	0.0650	-0.0001	0.0924	-0.0022	250	0.0892	-0.0001	0.0919	-0.0028
185	0.0653	-0.0001	0.0837	0.0014	251	0.0897	-0.0001	0.0941	0.0014
186	0.0656	-0.0001	0.0959	-0.0057	252	0.0900	-0.0001	0.0787	0.0031
187	0.0660	-0.0001	0.0979	-0.0012	253	0.0903	-0.0001	0.0799	0.0040
188	0.0664	-0.0001	0.0878	-0.0006	254	0.0906	-0.0001	0.0955	-0.0040
189	0.0667	-0.0001	0.0894	-0.0011	255	0.0910	-0.0002	0.0983	0.0159
190	0.0671	-0.0001	0.0916	-0.0024	256	0.0914	0.0000	0.0932	0.0137
191	0.0675	-0.0001	0.0885	-0.0007	257	0.0918	0.0000	0.1025	-0.0057
192	0.0678	-0.0001	0.0865	0.0024	258	0.0922	0.0000	0.0989	-0.0030
193	0.0681	-0.0001	0.0894	0.0018	259	0.0926	-0.0001	0.1011	-0.0049
194	0.0686	-0.0001	0.0930	0.0010	260	0.0930	-0.0001	0.0963	-0.0039

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
261	0.0934	-0.0001	0.0957	-0.0075	287	0.1031	0.0000	0.0941	0.0031
262	0.0938	-0.0001	0.0939	0.0017	288	0.1035	0.0000	0.0984	-0.0053
263	0.0941	-0.0001	0.0851	0.0019	289	0.1039	-0.0001	0.1002	-0.0047
264	0.0945	-0.0001	0.0884	-0.0031	290	0.1043	0.0000	0.0940	-0.0100
265	0.0948	-0.0001	0.0916	-0.0013	291	0.1046	-0.0001	0.0916	-0.0003
266	0.0952	-0.0001	0.0974	-0.0061	292	0.1050	0.0000	0.0937	0.0013
267	0.0956	-0.0002	0.0870	0.0033	293	0.1054	-0.0001	0.0907	-0.0051
268	0.0959	-0.0001	0.0799	0.0102	294	0.1058	-0.0001	0.0797	0.0165
269	0.0962	-0.0001	0.0873	0.0011	295	0.1060	0.0000	0.0828	0.0002
270	0.0966	-0.0001	0.1067	0.0053	296	0.1064	-0.0001	0.0971	-0.0037
271	0.0971	0.0000	0.0938	-0.0064	297	0.1068	0.0000	0.0926	-0.0005
272	0.0974	-0.0001	0.0829	0.0072	298	0.1072	-0.0001	0.0826	-0.0023
273	0.0977	0.0000	0.1000	0.0107	299	0.1074	0.0000	0.0931	0.0057
274	0.0982	0.0000	0.1081	-0.0090	300	0.1079	0.0000	0.1124	-0.0024
275	0.0986	0.0000	0.0943	-0.0072	301	0.1083	-0.0001	0.0996	0.0002
276	0.0989	-0.0001	0.0972	0.0006	302	0.1087	0.0000	0.0933	0.0098
277	0.0994	0.0000	0.0951	0.0041	303	0.1091	0.0000	0.0994	-0.0042
278	0.0997	-0.0001	0.0871	-0.0042	304	0.1095	-0.0001	0.1016	0.0001
279	0.1001	-0.0001	0.0880	-0.0024	305	0.1099	0.0000	0.0892	0.0012
280	0.1004	-0.0001	0.0997	0.0082	306	0.1102	-0.0001	0.0881	-0.0045
281	0.1009	0.0000	0.1037	-0.0009	307	0.1106	0.0000	0.0902	0.0031
282	0.1012	-0.0001	0.0859	-0.0106	308	0.1109	0.0000	0.0953	-0.0066
283	0.1016	-0.0001	0.0785	-0.0004	309	0.1114	-0.0001	0.0850	0.0026
284	0.1018	-0.0001	0.0912	0.0093	310	0.1116	0.0000	0.0902	-0.0022
285	0.1023	0.0000	0.1118	0.0087	311	0.1121	-0.0001	-	-
286	0.1027	0.0000	0.0971	-0.0005					

Table B3.3 Raw data of free-rising PP-3.059-SW in SW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0282	0.0018	0.0999	-0.0026
2	0.0004	-0.0001	0.1093	-0.0199	66	0.0285	0.0018	0.1100	0.0097
3	0.0009	-0.0002	0.0943	0.0161	67	0.0290	0.0019	0.1186	0.0113
4	0.0012	0.0000	0.0992	0.0344	68	0.0295	0.0019	0.1030	-0.0049
5	0.0017	0.0001	0.1049	0.0131	69	0.0299	0.0018	0.1180	0.0025
6	0.0020	0.0001	0.1092	0.0036	70	0.0304	0.0020	0.1189	0.0119
7	0.0025	0.0001	0.1137	0.0008	71	0.0308	0.0019	0.1024	-0.0088
8	0.0029	0.0001	0.1106	0.0169	72	0.0312	0.0019	0.1074	-0.0139
9	0.0034	0.0003	0.1149	0.0238	73	0.0317	0.0018	0.1141	0.0110
10	0.0039	0.0003	0.1105	0.0073	74	0.0322	0.0020	0.1209	0.0055
11	0.0043	0.0003	0.1019	0.0031	75	0.0326	0.0018	0.1068	-0.0262
12	0.0047	0.0003	0.1059	0.0217	76	0.0330	0.0018	0.0980	0.0058
13	0.0052	0.0005	0.1215	0.0249	77	0.0334	0.0019	0.1160	0.0260
14	0.0057	0.0005	0.1144	0.0030	78	0.0339	0.0020	0.1172	0.0066
15	0.0061	0.0005	0.0971	-0.0015	79	0.0344	0.0019	0.1151	-0.0005
16	0.0064	0.0005	0.0955	0.0094	80	0.0349	0.0020	0.1043	-0.0093
17	0.0068	0.0006	0.1117	0.0329	81	0.0352	0.0019	0.0930	0.0095
18	0.0073	0.0008	0.1110	0.0111	82	0.0356	0.0020	0.1124	0.0186
19	0.0077	0.0007	0.1009	0.0016	83	0.0361	0.0020	0.1167	-0.0026
20	0.0081	0.0008	0.1143	0.0280	84	0.0365	0.0020	0.1058	0.0175
21	0.0086	0.0009	0.1146	0.0355	85	0.0369	0.0022	0.1179	0.0364
22	0.0090	0.0011	0.1125	0.0010	86	0.0375	0.0023	0.1069	0.0165
23	0.0095	0.0009	0.1109	-0.0179	87	0.0378	0.0023	0.0975	-0.0052
24	0.0099	0.0009	0.1114	0.0416	88	0.0383	0.0023	0.1131	-0.0047
25	0.0104	0.0013	0.1138	0.0359	89	0.0387	0.0023	0.1106	0.0116
26	0.0108	0.0012	0.1111	-0.0367	90	0.0391	0.0024	0.1174	0.0141
27	0.0113	0.0010	0.1006	-0.0022	91	0.0396	0.0024	0.1079	-0.0015
28	0.0117	0.0012	0.1076	0.0373	92	0.0400	0.0023	0.1036	0.0069
29	0.0122	0.0013	0.1196	0.0064	93	0.0405	0.0024	0.1189	0.0210
30	0.0126	0.0013	0.1097	0.0017	94	0.0410	0.0025	0.1032	0.0211
31	0.0131	0.0013	0.1209	0.0264	95	0.0413	0.0026	0.1093	-0.0022
32	0.0136	0.0015	0.1108	0.0254	96	0.0418	0.0025	0.1137	-0.0116
33	0.0139	0.0015	0.1009	0.0032	97	0.0422	0.0025	0.0933	-0.0010
34	0.0144	0.0015	0.1123	0.0058	98	0.0426	0.0025	0.1080	0.0193
35	0.0148	0.0015	0.1156	0.0250	99	0.0431	0.0027	0.1229	0.0183
36	0.0153	0.0017	0.1156	0.0050	100	0.0436	0.0026	0.1147	-0.0017
37	0.0158	0.0016	0.1108	-0.0167	101	0.0440	0.0026	0.1138	0.0077
38	0.0162	0.0016	0.1029	-0.0039	102	0.0445	0.0027	0.1072	0.0033
39	0.0166	0.0015	0.1126	0.0318	103	0.0449	0.0027	0.1070	0.0040
40	0.0171	0.0018	0.1183	0.0185	104	0.0453	0.0027	0.1158	-0.0038
41	0.0175	0.0017	0.1108	-0.0206	105	0.0458	0.0026	0.1011	-0.0064
42	0.0180	0.0016	0.1073	0.0030	106	0.0461	0.0027	0.1107	0.0155
43	0.0184	0.0017	0.1034	0.0317	107	0.0467	0.0028	0.1137	-0.0071
44	0.0188	0.0019	0.1140	0.0093	108	0.0470	0.0026	0.1070	-0.0031
45	0.0193	0.0018	0.1186	-0.0191	109	0.0475	0.0027	0.1234	0.0255
46	0.0198	0.0017	0.1049	-0.0040	110	0.0480	0.0028	0.1048	-0.0017
47	0.0201	0.0018	0.1082	0.0244	111	0.0484	0.0027	0.1079	-0.0145
48	0.0206	0.0019	0.1139	0.0036	112	0.0489	0.0027	0.1176	-0.0063
49	0.0211	0.0018	0.1053	-0.0126	113	0.0493	0.0027	0.0997	0.0030
50	0.0215	0.0018	0.1217	0.0234	114	0.0497	0.0027	0.1219	0.0174
51	0.0220	0.0020	0.1243	0.0114	115	0.0503	0.0028	0.1157	-0.0153
52	0.0225	0.0019	0.1010	-0.0197	116	0.0506	0.0026	0.0977	-0.0210
53	0.0228	0.0018	0.1149	0.0055	117	0.0511	0.0026	0.1183	0.0191
54	0.0234	0.0020	0.1185	0.0178	118	0.0516	0.0028	0.1163	0.0005
55	0.0238	0.0020	0.1071	-0.0046	119	0.0520	0.0026	0.1070	-0.0098
56	0.0242	0.0019	0.1083	-0.0278	120	0.0524	0.0027	0.1207	0.0412
57	0.0247	0.0017	0.1034	-0.0190	121	0.0529	0.0030	0.1148	-0.0038
58	0.0251	0.0018	0.1136	0.0273	122	0.0533	0.0027	0.1046	-0.0210
59	0.0256	0.0020	0.1127	0.0050	123	0.0538	0.0028	0.1177	0.0215
60	0.0260	0.0018	0.1033	-0.0236	124	0.0543	0.0028	0.1177	-0.0001
61	0.0264	0.0018	0.1072	-0.0257	125	0.0547	0.0028	0.1133	0.0003
62	0.0268	0.0016	0.1106	0.0233	126	0.0552	0.0028	0.1232	0.0088
63	0.0273	0.0019	0.1133	0.0305	127	0.0557	0.0029	0.1130	-0.0118
64	0.0277	0.0019	0.1116	-0.0210	128	0.0561	0.0027	0.1091	-0.0099

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0566	0.0028	0.1199	0.0025	195	0.0863	0.0036	0.1006	-0.0039
130	0.0571	0.0028	0.1080	0.0099	196	0.0868	0.0036	0.1211	0.0183
131	0.0575	0.0029	0.1149	0.0082	197	0.0872	0.0037	0.1096	0.0112
132	0.0580	0.0028	0.1289	-0.0046	198	0.0876	0.0037	0.1117	-0.0014
133	0.0585	0.0028	0.1145	-0.0048	199	0.0881	0.0037	0.0987	0.0050
134	0.0589	0.0028	0.1138	-0.0054	200	0.0884	0.0037	0.0948	0.0026
135	0.0594	0.0028	0.1183	0.0063	201	0.0889	0.0037	0.1046	0.0146
136	0.0598	0.0028	0.1102	0.0081	202	0.0893	0.0039	0.0915	0.0081
137	0.0603	0.0029	0.1230	-0.0073	203	0.0896	0.0038	0.1142	0.0253
138	0.0608	0.0028	0.1188	-0.0264	204	0.0902	0.0041	0.1008	-0.0226
139	0.0612	0.0027	0.1044	0.0182	205	0.0904	0.0036	0.0997	0.0113
140	0.0617	0.0029	0.1230	0.0270	206	0.0910	0.0042	0.1000	0.0255
141	0.0622	0.0029	0.1201	-0.0311	207	0.0912	0.0038	0.0887	0.0217
142	0.0626	0.0027	0.0966	-0.0187	208	0.0917	0.0043	0.1185	0.0789
143	0.0630	0.0027	0.1156	0.0190	209	0.0922	0.0045	0.1112	0.0121
144	0.0635	0.0028	0.1258	0.0095	210	0.0926	0.0044	0.1032	-0.0082
145	0.0640	0.0028	0.1028	0.0028	211	0.0930	0.0044	0.0976	0.0168
146	0.0644	0.0028	0.1190	0.0102	212	0.0934	0.0046	0.1004	0.0293
147	0.0649	0.0029	0.1200	0.0033	213	0.0938	0.0046	0.0943	-0.0249
148	0.0653	0.0029	0.1034	0.0005	214	0.0941	0.0044	0.0894	0.0116
149	0.0658	0.0029	0.1270	0.0066	215	0.0945	0.0047	0.1070	0.0814
150	0.0663	0.0029	0.1163	0.0029	216	0.0950	0.0050	0.1034	0.0451
151	0.0667	0.0029	0.1006	-0.0027	217	0.0953	0.0051	0.1149	0.0105
152	0.0671	0.0029	0.1277	0.0186	218	0.0959	0.0051	0.1088	0.0010
153	0.0677	0.0030	0.1226	0.0120	219	0.0962	0.0051	0.0909	-0.0010
154	0.0681	0.0030	0.1029	-0.0172	220	0.0966	0.0051	0.1229	0.0479
155	0.0685	0.0029	0.1187	0.0139	221	0.0972	0.0055	0.0872	0.0318
156	0.0691	0.0031	0.1205	0.0169	222	0.0973	0.0053	0.0980	0.0070
157	0.0695	0.0030	0.1087	-0.0196	223	0.0980	0.0055	0.1183	0.0363
158	0.0699	0.0030	0.1232	0.0149	224	0.0983	0.0056	0.0906	0.0129
159	0.0705	0.0032	0.1179	0.0115	225	0.0987	0.0056	0.1046	0.0025
160	0.0709	0.0030	0.1017	-0.0237	226	0.0991	0.0057	0.0918	0.0156
161	0.0713	0.0030	0.1212	0.0156	227	0.0994	0.0057	0.1147	0.0318
162	0.0719	0.0032	0.1185	0.0124	228	0.1000	0.0059	0.1168	0.0514
163	0.0723	0.0031	0.1108	-0.0260	229	0.1004	0.0062	0.0978	0.0204
164	0.0727	0.0030	0.1169	0.0282	230	0.1008	0.0061	0.0949	-0.0498
165	0.0732	0.0033	0.1108	0.0084	231	0.1011	0.0058	0.0906	0.0073
166	0.0736	0.0030	0.1121	-0.0566	232	0.1015	0.0061	0.1184	0.0790
167	0.0741	0.0029	0.1158	0.0046	233	0.1021	0.0064	0.1219	0.0035
168	0.0746	0.0031	0.1022	0.0087	234	0.1025	0.0062	0.0978	-0.0006
169	0.0749	0.0029	0.1198	-0.0058	235	0.1029	0.0064	0.1020	0.0287
170	0.0755	0.0030	0.1176	0.0084	236	0.1033	0.0064	0.1121	0.0216
171	0.0758	0.0030	0.0909	-0.0140	237	0.1038	0.0066	0.1237	0.0314
172	0.0762	0.0029	0.1183	0.0183	238	0.1043	0.0066	0.1144	-0.0053
173	0.0768	0.0031	0.1217	0.0141	239	0.1047	0.0065	0.0950	-0.0036
174	0.0772	0.0030	0.1050	-0.0144	240	0.1051	0.0066	0.1160	0.0450
175	0.0776	0.0030	0.1151	0.0095	241	0.1056	0.0069	0.1105	-0.0274
176	0.0781	0.0031	0.1140	0.0142	242	0.1059	0.0064	0.1013	-0.0046
177	0.0785	0.0031	0.1089	-0.0027	243	0.1064	0.0068	0.1082	0.0087
178	0.0790	0.0031	0.1076	-0.0223	244	0.1068	0.0065	0.1114	-0.0479
179	0.0794	0.0030	0.1099	0.0131	245	0.1073	0.0065	0.1279	0.0438
180	0.0799	0.0032	0.1223	0.0249	246	0.1078	0.0068	0.1022	0.0013
181	0.0804	0.0032	0.1119	-0.0234	247	0.1081	0.0065	0.0890	0.0043
182	0.0808	0.0030	0.1002	-0.0259	248	0.1085	0.0068	0.1347	0.0623
183	0.0812	0.0029	0.1188	0.0445	249	0.1092	0.0070	0.1188	-0.0497
184	0.0817	0.0034	0.1160	0.0498	250	0.1095	0.0064	0.0918	-0.0114
185	0.0821	0.0033	0.0996	-0.0181	251	0.1099	0.0069	0.1045	0.0213
186	0.0825	0.0032	0.1005	-0.0303	252	0.1103	0.0066	0.1113	-0.0579
187	0.0829	0.0031	0.0972	0.0012	253	0.1108	0.0064	0.1205	0.0312
188	0.0833	0.0032	0.1247	0.0309	254	0.1113	0.0069	0.1037	0.0021
189	0.0839	0.0033	0.1149	0.0069	255	0.1117	0.0064	0.1195	-0.0639
190	0.0842	0.0033	0.0919	-0.0047	256	0.1123	0.0064	0.1335	0.0528
191	0.0846	0.0033	0.1019	-0.0123	257	0.1127	0.0069	0.0947	-0.0052
192	0.0850	0.0032	0.0993	0.0029	258	0.1130	0.0063	0.0955	-0.0354
193	0.0854	0.0033	0.1151	0.0594	259	0.1135	0.0066	0.1346	0.0674
194	0.0860	0.0036	0.1033	0.0299	260	0.1141	0.0069	0.1176	-0.0205

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
261	0.1144	0.0064	0.0940	-0.0411	299	0.1310	0.0043	0.1203	-0.0221
262	0.1148	0.0065	0.1025	-0.0089	300	0.1316	0.0042	0.1050	-0.0443
263	0.1153	0.0063	0.0940	-0.0225	301	0.1319	0.0039	0.1022	-0.0125
264	0.1156	0.0063	0.1226	0.0208	302	0.1324	0.0041	0.1086	0.0000
265	0.1162	0.0065	0.1145	-0.0374	303	0.1327	0.0039	0.1085	0.0114
266	0.1165	0.0060	0.0876	-0.0429	304	0.1333	0.0042	0.1323	0.0156
267	0.1169	0.0062	0.1290	0.0272	305	0.1338	0.0040	0.0997	-0.0469
268	0.1175	0.0063	0.1289	0.0015	306	0.1341	0.0038	0.0917	-0.0104
269	0.1180	0.0062	0.0955	-0.0188	307	0.1345	0.0040	0.1279	0.0355
270	0.1183	0.0061	0.1146	0.0015	308	0.1351	0.0041	0.1191	-0.0104
271	0.1189	0.0062	0.1160	-0.0236	309	0.1355	0.0039	0.1031	-0.0230
272	0.1192	0.0059	0.1070	-0.0466	310	0.1359	0.0039	0.1215	0.0255
273	0.1197	0.0058	0.1153	-0.0445	311	0.1364	0.0041	0.1099	-0.0054
274	0.1202	0.0056	0.0943	-0.0358	312	0.1368	0.0038	0.1081	-0.0374
275	0.1205	0.0055	0.1137	0.0293	313	0.1373	0.0038	0.1148	-0.0043
276	0.1211	0.0058	0.1114	-0.0602	314	0.1377	0.0038	0.0928	-0.0075
277	0.1214	0.0050	0.0979	-0.0498	315	0.1381	0.0037	0.1172	-0.0003
278	0.1218	0.0054	0.1339	0.0587	316	0.1386	0.0038	0.1180	-0.0053
279	0.1225	0.0055	0.1114	0.0102	317	0.1390	0.0037	0.0984	-0.0148
280	0.1227	0.0055	0.1027	-0.0417	318	0.1394	0.0037	0.1165	0.0129
281	0.1233	0.0052	0.1114	-0.0419	319	0.1399	0.0038	0.1133	0.0029
282	0.1236	0.0051	0.0908	-0.0175	320	0.1403	0.0037	0.1116	-0.0088
283	0.1240	0.0050	0.1115	-0.0081	321	0.1408	0.0037	0.1262	0.0049
284	0.1245	0.0051	0.1225	0.0041	322	0.1414	0.0037	0.1172	0.0012
285	0.1250	0.0051	0.1028	-0.0083	323	0.1418	0.0037	0.1014	-0.0120
286	0.1253	0.0050	0.0991	-0.0658	324	0.1422	0.0037	0.1047	-0.0341
287	0.1258	0.0045	0.1084	0.0037	325	0.1426	0.0034	0.1032	-0.0240
288	0.1262	0.0050	0.1190	0.0314	326	0.1430	0.0035	0.1147	0.0314
289	0.1267	0.0048	0.1045	-0.0807	327	0.1435	0.0037	0.1020	-0.0332
290	0.1270	0.0044	0.0965	-0.0207	328	0.1438	0.0032	0.1009	-0.0360
291	0.1275	0.0046	0.1273	0.0450	329	0.1443	0.0034	0.1306	0.0463
292	0.1281	0.0048	0.1138	-0.0116	330	0.1448	0.0036	0.1078	-0.0377
293	0.1284	0.0045	0.1042	-0.0500	331	0.1452	0.0031	0.1102	-0.0193
294	0.1289	0.0044	0.1102	-0.0194	332	0.1457	0.0034	0.1137	0.0096
295	0.1293	0.0044	0.0987	0.0033	333	0.1461	0.0032	0.1084	-0.0379
296	0.1297	0.0044	0.1233	0.0019	334	0.1466	0.0031	0.1270	0.0191
297	0.1303	0.0044	0.1161	-0.0055	335	0.1471	0.0033	0.1076	0.0079
298	0.1306	0.0043	0.0932	-0.0165	336	0.1475	0.0032	-	-

Table B3.4 Raw data of free-rising PP-3.228-SW in SW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0286	-0.0004	0.1100	0.0006
2	0.0004	0.0000	0.1037	-0.0053	66	0.0290	-0.0004	0.1134	0.0006
3	0.0008	0.0000	0.1019	-0.0045	67	0.0295	-0.0004	0.1143	0.0006
4	0.0013	-0.0001	0.1092	-0.0059	68	0.0300	-0.0003	0.1117	-0.0002
5	0.0017	-0.0001	0.1085	-0.0049	69	0.0304	-0.0004	0.1123	0.0000
6	0.0021	-0.0001	0.1084	-0.0038	70	0.0309	-0.0003	0.1131	0.0007
7	0.0026	-0.0001	0.1117	-0.0051	71	0.0313	-0.0003	0.1130	-0.0003
8	0.0030	-0.0001	0.1090	-0.0057	72	0.0318	-0.0004	0.1140	0.0011
9	0.0034	-0.0002	0.1080	-0.0021	73	0.0322	-0.0003	0.1132	0.0020
10	0.0039	-0.0002	0.1030	0.0006	74	0.0327	-0.0003	0.1129	0.0008
11	0.0043	-0.0002	0.1057	-0.0009	75	0.0331	-0.0003	0.1134	-0.0001
12	0.0047	-0.0002	0.1161	0.0008	76	0.0336	-0.0003	0.1117	0.0021
13	0.0052	-0.0002	0.1079	-0.0025	77	0.0340	-0.0003	0.1123	0.0020
14	0.0056	-0.0002	0.1080	-0.0083	78	0.0345	-0.0003	0.1164	-0.0009
15	0.0061	-0.0002	0.1161	-0.0151	79	0.0349	-0.0003	0.1141	0.0006
16	0.0065	-0.0003	0.1096	-0.0142	80	0.0354	-0.0003	0.1104	0.0022
17	0.0069	-0.0003	0.1035	-0.0076	81	0.0358	-0.0003	0.1141	-0.0015
18	0.0074	-0.0004	0.1100	-0.0058	82	0.0363	-0.0003	0.1118	0.0006
19	0.0078	-0.0004	0.1128	-0.0028	83	0.0367	-0.0003	0.1109	0.0041
20	0.0083	-0.0004	0.1114	-0.0022	84	0.0372	-0.0003	0.1187	-0.0006
21	0.0087	-0.0004	0.1146	-0.0042	85	0.0377	-0.0003	0.1123	-0.0024
22	0.0092	-0.0004	0.1112	-0.0028	86	0.0381	-0.0003	0.1081	0.0007
23	0.0096	-0.0004	0.1096	-0.0009	87	0.0385	-0.0003	0.1180	0.0009
24	0.0100	-0.0004	0.1111	0.0000	88	0.0390	-0.0003	0.1156	-0.0009
25	0.0105	-0.0004	0.1131	-0.0011	89	0.0395	-0.0003	0.1080	0.0010
26	0.0110	-0.0004	0.1137	-0.0020	90	0.0399	-0.0003	0.1145	0.0000
27	0.0114	-0.0004	0.1111	0.0003	91	0.0404	-0.0003	0.1154	0.0029
28	0.0118	-0.0004	0.1140	-0.0002	92	0.0408	-0.0003	0.1082	0.0026
29	0.0123	-0.0004	0.1146	-0.0016	93	0.0412	-0.0003	0.1159	0.0002
30	0.0128	-0.0004	0.1110	-0.0018	94	0.0417	-0.0003	0.1178	0.0017
31	0.0132	-0.0005	0.1117	0.0011	95	0.0422	-0.0003	0.1109	0.0000
32	0.0137	-0.0004	0.1147	0.0033	96	0.0426	-0.0003	0.1125	0.0033
33	0.0141	-0.0004	0.1134	-0.0019	97	0.0431	-0.0002	0.1128	0.0024
34	0.0146	-0.0005	0.1123	-0.0023	98	0.0435	-0.0003	0.1120	-0.0022
35	0.0150	-0.0004	0.1129	0.0039	99	0.0440	-0.0003	0.1141	0.0011
36	0.0155	-0.0004	0.1141	0.0016	100	0.0444	-0.0002	0.1148	0.0036
37	0.0159	-0.0004	0.1141	-0.0016	101	0.0449	-0.0002	0.1114	0.0008
38	0.0164	-0.0004	0.1127	0.0016	102	0.0453	-0.0002	0.1147	-0.0003
39	0.0168	-0.0004	0.1135	0.0010	103	0.0458	-0.0002	0.1167	-0.0005
40	0.0173	-0.0004	0.1116	-0.0002	104	0.0463	-0.0002	0.1082	0.0037
41	0.0177	-0.0004	0.1097	-0.0009	105	0.0467	-0.0002	0.1130	0.0004
42	0.0182	-0.0004	0.1118	0.0000	106	0.0472	-0.0002	0.1169	-0.0027
43	0.0186	-0.0004	0.1145	0.0020	107	0.0476	-0.0002	0.1081	0.0028
44	0.0191	-0.0004	0.1166	-0.0016	108	0.0480	-0.0002	0.1149	0.0024
45	0.0195	-0.0004	0.1166	-0.0011	109	0.0485	-0.0002	0.1187	-0.0048
46	0.0200	-0.0004	0.1115	0.0045	110	0.0490	-0.0003	0.1094	-0.0004
47	0.0204	-0.0004	0.1115	0.0024	111	0.0494	-0.0002	0.1145	0.0040
48	0.0209	-0.0004	0.1130	-0.0003	112	0.0499	-0.0002	0.1159	-0.0050
49	0.0213	-0.0004	0.1109	0.0013	113	0.0503	-0.0003	0.1099	0.0002
50	0.0218	-0.0004	0.1137	-0.0019	114	0.0508	-0.0002	0.1155	0.0027
51	0.0222	-0.0004	0.1147	-0.0017	115	0.0513	-0.0002	0.1153	-0.0016
52	0.0227	-0.0004	0.1127	0.0008	116	0.0517	-0.0002	0.1161	0.0002
53	0.0232	-0.0004	0.1134	0.0015	117	0.0522	-0.0002	0.1224	0.0010
54	0.0236	-0.0004	0.1139	0.0011	118	0.0527	-0.0002	0.1142	-0.0013
55	0.0241	-0.0004	0.1117	0.0020	119	0.0531	-0.0002	0.1129	-0.0016
56	0.0245	-0.0004	0.1133	0.0015	120	0.0536	-0.0002	0.1187	0.0027
57	0.0250	-0.0004	0.1120	0.0012	121	0.0541	-0.0002	0.1129	-0.0011
58	0.0254	-0.0004	0.1122	0.0026	122	0.0545	-0.0002	0.1138	-0.0031
59	0.0259	-0.0004	0.1167	-0.0017	123	0.0550	-0.0002	0.1188	0.0029
60	0.0263	-0.0004	0.1136	0.0011	124	0.0554	-0.0002	0.1238	-0.0004
61	0.0268	-0.0004	0.1121	0.0035	125	0.0560	-0.0002	0.1200	-0.0056
62	0.0272	-0.0004	0.1142	0.0017	126	0.0564	-0.0003	0.1111	-0.0003
63	0.0277	-0.0003	0.1157	-0.0001	127	0.0568	-0.0003	0.1208	0.0029
64	0.0282	-0.0004	0.1135	-0.0016	128	0.0574	-0.0002	0.1191	-0.0002

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0578	-0.0003	0.1078	0.0000	195	0.0893	-0.0004	0.1252	-0.0021
130	0.0582	-0.0002	0.1184	0.0004	196	0.0898	-0.0004	0.1215	0.0002
131	0.0587	-0.0002	0.1213	-0.0004	197	0.0903	-0.0004	0.1145	0.0015
132	0.0592	-0.0003	0.1142	0.0000	198	0.0908	-0.0004	0.1216	-0.0042
133	0.0597	-0.0002	0.1209	-0.0026	199	0.0913	-0.0004	0.1164	-0.0012
134	0.0602	-0.0003	0.1184	-0.0016	200	0.0917	-0.0004	0.1092	0.0021
135	0.0606	-0.0003	0.1141	0.0005	201	0.0921	-0.0004	0.1203	-0.0002
136	0.0611	-0.0003	0.1180	0.0017	202	0.0926	-0.0004	0.1217	-0.0009
137	0.0615	-0.0002	0.1221	-0.0003	203	0.0931	-0.0004	0.1172	-0.0016
138	0.0621	-0.0003	0.1201	-0.0046	204	0.0936	-0.0004	0.1129	-0.0026
139	0.0625	-0.0003	0.1133	0.0000	205	0.0940	-0.0005	0.1167	-0.0009
140	0.0630	-0.0003	0.1190	-0.0006	206	0.0945	-0.0004	0.1228	0.0006
141	0.0635	-0.0003	0.1208	-0.0007	207	0.0950	-0.0004	0.1161	-0.0007
142	0.0639	-0.0003	0.1201	0.0007	208	0.0954	-0.0004	0.1205	0.0009
143	0.0644	-0.0003	0.1238	-0.0016	209	0.0960	-0.0004	0.1252	0.0000
144	0.0649	-0.0003	0.1161	-0.0009	210	0.0964	-0.0004	0.1187	0.0001
145	0.0653	-0.0003	0.1119	0.0005	211	0.0969	-0.0004	0.1208	-0.0001
146	0.0658	-0.0003	0.1190	0.0003	212	0.0974	-0.0004	0.1213	-0.0009
147	0.0663	-0.0003	0.1269	-0.0008	213	0.0979	-0.0004	0.1153	-0.0003
148	0.0668	-0.0003	0.1216	-0.0026	214	0.0983	-0.0004	0.1161	-0.0011
149	0.0673	-0.0003	0.1129	-0.0011	215	0.0988	-0.0005	0.1270	-0.0016
150	0.0677	-0.0003	0.1190	0.0018	216	0.0994	-0.0005	0.1205	0.0008
151	0.0682	-0.0003	0.1188	-0.0013	217	0.0998	-0.0004	0.1105	-0.0032
152	0.0687	-0.0003	0.1188	-0.0011	218	0.1002	-0.0005	0.1204	-0.0023
153	0.0692	-0.0003	0.1224	0.0010	219	0.1007	-0.0005	0.1183	0.0060
154	0.0697	-0.0003	0.1145	-0.0012	220	0.1012	-0.0004	0.1096	-0.0014
155	0.0701	-0.0003	0.1162	-0.0026	221	0.1016	-0.0005	0.1190	-0.0013
156	0.0706	-0.0003	0.1194	0.0002	222	0.1021	-0.0004	0.1185	-0.0002
157	0.0710	-0.0003	0.1214	0.0007	223	0.1026	-0.0005	0.1162	-0.0019
158	0.0716	-0.0003	0.1250	-0.0021	224	0.1031	-0.0005	0.1229	0.0038
159	0.0720	-0.0003	0.1241	0.0020	225	0.1035	-0.0004	0.1139	-0.0023
160	0.0726	-0.0003	0.1225	0.0004	226	0.1040	-0.0005	0.1149	-0.0009
161	0.0730	-0.0003	0.1149	-0.0048	227	0.1045	-0.0005	0.1207	0.0032
162	0.0735	-0.0003	0.1153	0.0002	228	0.1049	-0.0005	0.1220	-0.0012
163	0.0739	-0.0003	0.1170	0.0003	229	0.1054	-0.0005	0.1189	0.0033
164	0.0744	-0.0003	0.1203	-0.0016	230	0.1059	-0.0004	0.1126	0.0025
165	0.0749	-0.0003	0.1216	0.0001	231	0.1063	-0.0004	0.1187	-0.0011
166	0.0754	-0.0003	0.1133	0.0017	232	0.1068	-0.0004	0.1169	0.0060
167	0.0758	-0.0003	0.1207	0.0011	233	0.1073	-0.0004	0.1136	0.0041
168	0.0763	-0.0003	0.1248	-0.0016	234	0.1078	-0.0004	0.1217	-0.0001
169	0.0768	-0.0003	0.1209	-0.0006	235	0.1083	-0.0004	0.1196	-0.0011
170	0.0773	-0.0003	0.1224	-0.0014	236	0.1087	-0.0004	0.1150	0.0037
171	0.0778	-0.0003	0.1186	-0.0022	237	0.1092	-0.0004	0.1209	0.0063
172	0.0783	-0.0003	0.1183	-0.0002	238	0.1097	-0.0004	0.1265	0.0036
173	0.0787	-0.0003	0.1134	0.0002	239	0.1102	-0.0003	0.1186	0.0073
174	0.0792	-0.0003	0.1204	-0.0004	240	0.1106	-0.0003	0.1129	0.0014
175	0.0797	-0.0004	0.1309	-0.0007	241	0.1111	-0.0003	0.1220	0.0030
176	0.0802	-0.0004	0.1217	-0.0015	242	0.1116	-0.0003	0.1216	0.0063
177	0.0807	-0.0004	0.1182	-0.0022	243	0.1121	-0.0003	0.1192	0.0022
178	0.0812	-0.0004	0.1195	-0.0027	244	0.1126	-0.0003	0.1211	0.0085
179	0.0816	-0.0004	0.1169	-0.0008	245	0.1130	-0.0002	0.1148	0.0021
180	0.0821	-0.0004	0.1165	0.0001	246	0.1135	-0.0002	0.1132	0.0013
181	0.0826	-0.0004	0.1252	-0.0014	247	0.1139	-0.0002	0.1161	0.0064
182	0.0831	-0.0004	0.1217	0.0014	248	0.1144	-0.0002	0.1098	-0.0001
183	0.0835	-0.0004	0.1138	0.0002	249	0.1148	-0.0002	0.1108	0.0028
184	0.0840	-0.0004	0.1218	-0.0035	250	0.1153	-0.0002	0.1164	0.0064
185	0.0845	-0.0004	0.1210	-0.0016	251	0.1157	-0.0001	0.1101	0.0111
186	0.0850	-0.0004	0.1177	0.0020	252	0.1162	-0.0001	0.1113	0.0180
187	0.0855	-0.0004	0.1220	0.0019	253	0.1166	0.0000	0.1143	0.0171
188	0.0860	-0.0004	0.1250	-0.0025	254	0.1171	0.0001	0.1105	0.0126
189	0.0865	-0.0004	0.1221	-0.0002	255	0.1175	0.0001	0.1152	0.0098
190	0.0869	-0.0004	0.1134	0.0015	256	0.1180	0.0001	0.1166	0.0062
191	0.0874	-0.0004	0.1195	-0.0019	257	0.1185	0.0001	0.1107	0.0022
192	0.0879	-0.0004	0.1185	-0.0014	258	0.1189	0.0001	0.1088	0.0035
193	0.0883	-0.0004	0.1191	-0.0001	259	0.1193	0.0002	0.1113	0.0148
194	0.0888	-0.0004	0.1266	-0.0003	260	0.1198	0.0003	0.1083	0.0182

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
261	0.1202	0.0003	0.1123	0.0137	306	0.1400	0.0021	0.1086	0.0014
262	0.1207	0.0004	0.1208	0.0126	307	0.1404	0.0021	0.1059	-0.0013
263	0.1212	0.0004	0.1081	0.0055	308	0.1409	0.0021	0.1160	-0.0012
264	0.1215	0.0004	0.1085	0.0041	309	0.1414	0.0021	0.1113	0.0002
265	0.1220	0.0005	0.1186	0.0070	310	0.1418	0.0021	0.1061	-0.0027
266	0.1225	0.0005	0.1102	0.0057	311	0.1422	0.0021	0.1151	-0.0021
267	0.1229	0.0005	0.1082	0.0057	312	0.1427	0.0021	0.1131	-0.0017
268	0.1234	0.0005	0.1174	0.0163	313	0.1431	0.0021	0.1096	-0.0031
269	0.1238	0.0006	0.1100	0.0209	314	0.1436	0.0021	0.1059	-0.0003
270	0.1242	0.0007	0.1067	0.0170	315	0.1440	0.0021	0.1066	-0.0011
271	0.1247	0.0008	0.1173	0.0109	316	0.1444	0.0021	0.1141	-0.0027
272	0.1252	0.0008	0.1084	0.0080	317	0.1449	0.0021	0.1097	-0.0015
273	0.1256	0.0008	0.1009	0.0094	318	0.1453	0.0020	0.1089	-0.0018
274	0.1260	0.0008	0.1101	0.0142	319	0.1457	0.0020	0.1140	-0.0024
275	0.1264	0.0009	0.1109	0.0212	320	0.1462	0.0020	0.1080	-0.0021
276	0.1269	0.0010	0.1080	0.0189	321	0.1466	0.0020	0.1047	0.0008
277	0.1273	0.0011	0.1144	0.0143	322	0.1470	0.0020	0.1093	-0.0011
278	0.1278	0.0011	0.1100	0.0136	323	0.1475	0.0020	0.1074	-0.0023
279	0.1282	0.0012	0.1074	0.0201	324	0.1479	0.0020	0.1050	-0.0014
280	0.1286	0.0013	0.1158	0.0204	325	0.1483	0.0020	0.1120	-0.0019
281	0.1291	0.0014	0.1123	0.0158	326	0.1488	0.0020	0.1133	-0.0017
282	0.1295	0.0014	0.1090	0.0133	327	0.1492	0.0020	0.1114	-0.0010
283	0.1300	0.0015	0.1047	0.0096	328	0.1497	0.0020	0.1131	-0.0042
284	0.1304	0.0015	0.1056	0.0071	329	0.1501	0.0020	0.1131	-0.0013
285	0.1308	0.0015	0.1118	0.0123	330	0.1506	0.0020	0.1122	0.0021
286	0.1313	0.0016	0.1073	0.0198	331	0.1510	0.0020	0.1134	-0.0032
287	0.1317	0.0017	0.1038	0.0170	332	0.1515	0.0020	0.1104	-0.0001
288	0.1321	0.0017	0.1084	0.0128	333	0.1519	0.0020	0.1105	-0.0002
289	0.1326	0.0018	0.1110	0.0115	334	0.1524	0.0020	0.1116	-0.0027
290	0.1330	0.0018	0.1085	0.0088	335	0.1528	0.0020	0.1118	-0.0017
291	0.1334	0.0019	0.1100	0.0046	336	0.1533	0.0019	0.1155	-0.0026
292	0.1339	0.0019	0.1125	0.0045	337	0.1537	0.0019	0.1117	-0.0021
293	0.1343	0.0019	0.1100	0.0125	338	0.1542	0.0019	0.1106	-0.0016
294	0.1348	0.0020	0.1062	0.0162	339	0.1546	0.0019	0.1108	-0.0023
295	0.1352	0.0020	0.1118	0.0134	340	0.1550	0.0019	0.1053	-0.0008
296	0.1356	0.0021	0.1141	0.0074	341	0.1555	0.0019	0.1077	0.0004
297	0.1361	0.0021	0.1032	0.0020	342	0.1559	0.0019	0.1112	-0.0009
298	0.1365	0.0021	0.1076	0.0048	343	0.1563	0.0019	0.1066	-0.0001
299	0.1370	0.0021	0.1158	0.0032	344	0.1568	0.0019	0.1048	-0.0020
300	0.1374	0.0021	0.1072	-0.0007	345	0.1572	0.0019	0.1086	-0.0008
301	0.1378	0.0021	0.1082	0.0020	346	0.1576	0.0019	0.1090	0.0017
302	0.1383	0.0021	0.1149	0.0018	347	0.1581	0.0019	0.1090	-0.0011
303	0.1387	0.0021	0.1087	0.0022	348	0.1585	0.0019	0.1119	-0.0045
304	0.1391	0.0021	0.1040	-0.0021	349	0.1590	0.0019	0.1120	0.0001
305	0.1396	0.0021	0.1105	-0.0033	350	0.1594	0.0019	-	-

Table B3.5 Raw data of free-rising WD-2.861-SW in SW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0283	0.0001	0.1134	0.0009
2	0.0005	0.0000	0.1058	-0.0014	66	0.0288	0.0001	0.1226	0.0014
3	0.0008	0.0000	0.1038	-0.0068	67	0.0293	0.0001	0.1230	0.0021
4	0.0013	-0.0001	0.1141	-0.0057	68	0.0298	0.0001	0.1204	0.0040
5	0.0018	-0.0001	0.1120	0.0006	69	0.0303	0.0001	0.1189	0.0023
6	0.0022	-0.0001	0.1098	-0.0027	70	0.0307	0.0001	0.1223	-0.0001
7	0.0026	-0.0001	0.1127	-0.0040	71	0.0313	0.0001	0.1265	0.0010
8	0.0031	-0.0001	0.1121	0.0002	72	0.0317	0.0001	0.1249	0.0024
9	0.0035	-0.0001	0.1133	-0.0003	73	0.0323	0.0001	0.1233	0.0014
10	0.0040	-0.0001	0.1162	0.0009	74	0.0327	0.0001	0.1153	-0.0022
11	0.0045	-0.0001	0.1162	-0.0009	75	0.0332	0.0001	0.1184	0.0007
12	0.0049	-0.0001	0.1170	-0.0018	76	0.0337	0.0001	0.1186	-0.0002
13	0.0054	-0.0001	0.1171	0.0005	77	0.0341	0.0001	0.1193	0.0000
14	0.0059	-0.0001	0.1149	-0.0026	78	0.0346	0.0001	0.1208	0.0036
15	0.0063	-0.0001	0.1174	-0.0010	79	0.0351	0.0001	0.1157	-0.0016
16	0.0068	-0.0001	0.1157	0.0065	80	0.0356	0.0001	0.1195	0.0009
17	0.0072	-0.0001	0.1124	0.0026	81	0.0361	0.0001	0.1171	0.0021
18	0.0077	-0.0001	0.1140	0.0003	82	0.0365	0.0001	0.1194	0.0006
19	0.0082	-0.0001	0.1160	0.0047	83	0.0370	0.0001	0.1142	0.0062
20	0.0086	0.0000	0.1152	-0.0007	84	0.0374	0.0002	0.1061	0.0125
21	0.0091	-0.0001	0.1128	-0.0033	85	0.0379	0.0002	0.1158	0.0187
22	0.0095	-0.0001	0.1104	-0.0010	86	0.0383	0.0003	0.1164	0.0196
23	0.0100	-0.0001	0.1085	-0.0015	87	0.0388	0.0004	0.1109	0.0137
24	0.0104	-0.0001	0.1120	0.0006	88	0.0392	0.0004	0.1127	0.0041
25	0.0109	-0.0001	0.1113	0.0042	89	0.0397	0.0004	0.1154	0.0038
26	0.0113	0.0000	0.1086	0.0008	90	0.0401	0.0005	0.1132	0.0027
27	0.0117	-0.0001	0.1124	-0.0017	91	0.0406	0.0005	0.1134	-0.0022
28	0.0122	-0.0001	0.1128	0.0021	92	0.0411	0.0004	0.1119	-0.0013
29	0.0126	0.0000	0.1095	0.0039	93	0.0415	0.0004	0.1091	-0.0020
30	0.0131	0.0000	0.1018	-0.0009	94	0.0419	0.0004	0.1103	-0.0031
31	0.0134	0.0000	0.1054	-0.0007	95	0.0424	0.0004	0.1124	-0.0014
32	0.0139	0.0000	0.1098	0.0003	96	0.0428	0.0004	0.1127	-0.0055
33	0.0143	0.0000	0.1036	-0.0010	97	0.0433	0.0004	0.1119	-0.0069
34	0.0147	0.0000	0.1051	-0.0005	98	0.0437	0.0004	0.1106	-0.0024
35	0.0152	0.0000	0.1071	-0.0026	99	0.0442	0.0004	0.1087	-0.0042
36	0.0156	-0.0001	0.1077	0.0000	100	0.0446	0.0003	0.1025	-0.0096
37	0.0160	0.0000	0.1061	0.0009	101	0.0450	0.0003	0.1062	-0.0076
38	0.0164	-0.0001	0.0953	-0.0002	102	0.0454	0.0003	0.1133	-0.0032
39	0.0168	0.0000	0.0926	-0.0008	103	0.0459	0.0003	0.1082	-0.0028
40	0.0172	-0.0001	0.1035	-0.0004	104	0.0463	0.0002	0.1018	-0.0068
41	0.0176	-0.0001	0.1060	0.0013	105	0.0467	0.0002	0.1080	-0.0062
42	0.0180	0.0000	0.1088	0.0015	106	0.0472	0.0002	0.1133	-0.0007
43	0.0185	0.0000	0.1092	0.0009	107	0.0476	0.0002	0.1119	-0.0079
44	0.0189	0.0000	0.1082	0.0024	108	0.0481	0.0001	0.1138	-0.0212
45	0.0194	0.0000	0.1100	0.0018	109	0.0485	0.0000	0.1137	-0.0195
46	0.0198	0.0000	0.1055	-0.0028	110	0.0490	0.0000	0.1124	-0.0146
47	0.0202	0.0000	0.1068	-0.0022	111	0.0494	-0.0001	0.1131	-0.0130
48	0.0206	0.0000	0.1106	0.0006	112	0.0499	-0.0001	0.1130	-0.0080
49	0.0211	0.0000	0.1080	0.0019	113	0.0503	-0.0002	0.1105	-0.0078
50	0.0215	0.0000	0.1073	-0.0020	114	0.0508	-0.0002	0.1150	-0.0177
51	0.0219	-0.0001	0.1143	-0.0011	115	0.0512	-0.0003	0.1139	-0.0201
52	0.0224	0.0000	0.1144	0.0046	116	0.0517	-0.0004	0.1082	-0.0127
53	0.0229	0.0000	0.1098	0.0023	117	0.0521	-0.0004	0.1120	-0.0075
54	0.0233	0.0000	0.1112	0.0008	118	0.0526	-0.0004	0.1156	-0.0036
55	0.0237	0.0000	0.1123	0.0028	119	0.0530	-0.0004	0.1140	-0.0041
56	0.0242	0.0000	0.1123	0.0020	120	0.0535	-0.0004	0.1154	-0.0024
57	0.0246	0.0000	0.1148	0.0009	121	0.0540	-0.0004	0.1131	-0.0021
58	0.0251	0.0000	0.1148	0.0019	122	0.0544	-0.0005	0.1104	-0.0018
59	0.0256	0.0000	0.1136	0.0024	123	0.0548	-0.0005	0.1178	0.0006
60	0.0260	0.0000	0.1213	0.0009	124	0.0553	-0.0005	0.1182	-0.0002
61	0.0265	0.0000	0.1181	0.0042	125	0.0558	-0.0005	0.1131	-0.0009
62	0.0270	0.0001	0.1112	0.0007	126	0.0562	-0.0005	0.1096	-0.0014
63	0.0274	0.0000	0.1162	-0.0010	127	0.0567	-0.0005	0.1078	0.0015
64	0.0279	0.0001	0.1144	0.0031	128	0.0571	-0.0005	0.1115	0.0010

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0575	-0.0005	0.1164	0.0008	195	0.0862	-0.0004	0.1082	0.0028
130	0.0580	-0.0004	0.1139	0.0043	196	0.0867	-0.0004	0.1047	-0.0009
131	0.0585	-0.0004	0.1053	0.0012	197	0.0871	-0.0004	0.1049	-0.0037
132	0.0589	-0.0004	0.0990	-0.0031	198	0.0875	-0.0004	0.1082	0.0020
133	0.0593	-0.0005	0.1096	-0.0023	199	0.0879	-0.0004	0.1067	-0.0001
134	0.0597	-0.0005	0.1164	0.0005	200	0.0884	-0.0004	0.1027	-0.0032
135	0.0602	-0.0005	0.1052	-0.0005	201	0.0888	-0.0004	0.1055	0.0016
136	0.0606	-0.0005	0.1046	-0.0006	202	0.0892	-0.0004	0.1079	0.0017
137	0.0610	-0.0005	0.1100	0.0011	203	0.0896	-0.0004	0.1070	0.0013
138	0.0615	-0.0004	0.1125	0.0025	204	0.0901	-0.0004	0.1036	0.0003
139	0.0619	-0.0004	0.1049	-0.0001	205	0.0905	-0.0004	0.1052	-0.0025
140	0.0623	-0.0004	0.1043	0.0008	206	0.0909	-0.0004	0.1152	0.0007
141	0.0628	-0.0004	0.1073	0.0037	207	0.0914	-0.0004	0.1096	0.0007
142	0.0632	-0.0004	0.1000	0.0008	208	0.0918	-0.0004	0.0982	-0.0029
143	0.0636	-0.0004	0.0990	0.0004	209	0.0922	-0.0004	0.1036	-0.0009
144	0.0640	-0.0004	0.1016	-0.0014	210	0.0926	-0.0004	0.1092	-0.0006
145	0.0644	-0.0004	0.1061	-0.0007	211	0.0930	-0.0004	0.1117	-0.0026
146	0.0648	-0.0004	0.1062	0.0022	212	0.0935	-0.0004	0.1154	0.0000
147	0.0652	-0.0004	0.1003	-0.0013	213	0.0940	-0.0004	0.1140	0.0014
148	0.0656	-0.0004	0.0952	-0.0002	214	0.0944	-0.0004	0.1115	-0.0022
149	0.0660	-0.0004	0.0973	0.0000	215	0.0949	-0.0004	0.1130	-0.0040
150	0.0664	-0.0004	0.1063	0.0004	216	0.0953	-0.0004	0.1155	-0.0027
151	0.0668	-0.0004	0.1092	0.0028	217	0.0958	-0.0004	0.1103	-0.0014
152	0.0673	-0.0004	0.1049	0.0014	218	0.0962	-0.0004	0.1017	-0.0015
153	0.0677	-0.0004	0.0986	-0.0011	219	0.0966	-0.0005	0.1077	-0.0019
154	0.0680	-0.0004	0.1046	0.0003	220	0.0971	-0.0005	0.1165	-0.0008
155	0.0685	-0.0004	0.1133	0.0037	221	0.0975	-0.0005	0.1124	-0.0038
156	0.0690	-0.0004	0.1031	0.0025	222	0.0980	-0.0005	0.1128	-0.0039
157	0.0693	-0.0004	0.0967	0.0006	223	0.0984	-0.0005	0.1074	-0.0011
158	0.0697	-0.0004	0.0998	-0.0005	224	0.0988	-0.0005	0.1077	-0.0005
159	0.0701	-0.0004	0.1079	-0.0008	225	0.0993	-0.0005	0.1156	-0.0018
160	0.0706	-0.0004	0.1175	0.0023	226	0.0998	-0.0005	0.1132	-0.0011
161	0.0711	-0.0004	0.1094	0.0006	227	0.1002	-0.0005	0.1112	-0.0020
162	0.0715	-0.0004	0.1015	-0.0021	228	0.1006	-0.0005	0.1101	-0.0155
163	0.0719	-0.0004	0.1088	-0.0013	229	0.1011	-0.0006	0.1121	-0.0170
164	0.0723	-0.0004	0.1126	-0.0006	230	0.1015	-0.0007	0.1084	-0.0107
165	0.0728	-0.0004	0.1093	0.0015	231	0.1019	-0.0007	0.1026	-0.0106
166	0.0732	-0.0004	0.1128	0.0024	232	0.1024	-0.0007	0.1118	-0.0066
167	0.0737	-0.0004	0.1117	0.0026	233	0.1028	-0.0008	0.1132	-0.0064
168	0.0741	-0.0004	0.1080	0.0005	234	0.1033	-0.0008	0.1050	-0.0062
169	0.0745	-0.0004	0.1091	-0.0016	235	0.1037	-0.0008	0.1110	-0.0052
170	0.0750	-0.0004	0.1082	0.0005	236	0.1042	-0.0008	0.1118	-0.0055
171	0.0754	-0.0004	0.1152	0.0001	237	0.1046	-0.0009	0.1048	-0.0167
172	0.0759	-0.0004	0.1214	0.0018	238	0.1050	-0.0010	0.0982	-0.0238
173	0.0764	-0.0003	0.1150	0.0042	239	0.1054	-0.0010	0.0963	-0.0174
174	0.0768	-0.0003	0.1125	0.0008	240	0.1058	-0.0011	0.1043	-0.0128
175	0.0773	-0.0003	0.1149	0.0009	241	0.1062	-0.0012	0.1085	-0.0118
176	0.0777	-0.0003	0.1138	0.0008	242	0.1066	-0.0012	0.1083	-0.0187
177	0.0782	-0.0003	0.1129	-0.0028	243	0.1071	-0.0013	0.1009	-0.0240
178	0.0786	-0.0004	0.1111	-0.0019	244	0.1074	-0.0014	0.1036	-0.0187
179	0.0791	-0.0004	0.1118	0.0003	245	0.1079	-0.0015	0.1082	-0.0096
180	0.0795	-0.0004	0.1151	-0.0034	246	0.1083	-0.0015	0.0993	-0.0069
181	0.0800	-0.0004	0.1164	-0.0004	247	0.1087	-0.0015	0.0944	-0.0058
182	0.0805	-0.0004	0.1126	0.0021	248	0.1091	-0.0015	0.0961	-0.0090
183	0.0809	-0.0004	0.1097	-0.0018	249	0.1095	-0.0016	0.1039	-0.0241
184	0.0813	-0.0004	0.1126	0.0001	250	0.1099	-0.0017	0.1080	-0.0258
185	0.0818	-0.0004	0.1120	0.0022	251	0.1103	-0.0018	0.1040	-0.0165
186	0.0822	-0.0004	0.1076	0.0003	252	0.1107	-0.0018	0.1002	-0.0117
187	0.0827	-0.0004	0.1113	0.0022	253	0.1111	-0.0019	0.0986	-0.0201
188	0.0831	-0.0003	0.1126	0.0010	254	0.1115	-0.0020	0.0993	-0.0251
189	0.0836	-0.0004	0.1091	-0.0028	255	0.1119	-0.0021	0.1049	-0.0150
190	0.0840	-0.0004	0.1132	0.0002	256	0.1124	-0.0021	0.1054	-0.0109
191	0.0845	-0.0003	0.1136	0.0005	257	0.1128	-0.0022	0.1002	-0.0075
192	0.0849	-0.0004	0.1113	-0.0039	258	0.1132	-0.0022	0.0984	-0.0047
193	0.0854	-0.0004	0.1121	-0.0031	259	0.1135	-0.0022	0.1058	-0.0065
194	0.0858	-0.0004	0.1106	0.0004	260	0.1140	-0.0022	0.1131	-0.0183

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
261	0.1144	-0.0023	0.1069	-0.0253	319	0.1393	-0.0025	0.1014	-0.0044
262	0.1149	-0.0024	0.1030	-0.0146	320	0.1397	-0.0025	0.1134	-0.0058
263	0.1153	-0.0025	0.1068	-0.0061	321	0.1402	-0.0026	0.1132	-0.0134
264	0.1157	-0.0025	0.1061	-0.0035	322	0.1406	-0.0026	0.1035	-0.0202
265	0.1161	-0.0025	0.1044	-0.0037	323	0.1410	-0.0027	0.1118	-0.0165
266	0.1165	-0.0025	0.1029	-0.0029	324	0.1415	-0.0028	0.1119	-0.0125
267	0.1169	-0.0025	0.1067	0.0000	325	0.1419	-0.0028	0.1056	-0.0071
268	0.1174	-0.0025	0.1094	-0.0002	326	0.1424	-0.0028	0.1017	-0.0042
269	0.1178	-0.0025	0.1069	-0.0005	327	0.1427	-0.0028	0.1054	-0.0065
270	0.1183	-0.0025	0.1029	0.0006	328	0.1432	-0.0029	0.1131	-0.0057
271	0.1186	-0.0025	0.1053	0.0003	329	0.1436	-0.0029	0.1093	-0.0204
272	0.1191	-0.0025	0.1135	-0.0007	330	0.1441	-0.0030	0.1076	-0.0279
273	0.1195	-0.0025	0.1091	0.0025	331	0.1445	-0.0031	0.1086	-0.0157
274	0.1200	-0.0025	0.1112	0.0033	332	0.1449	-0.0032	0.1069	-0.0122
275	0.1204	-0.0025	0.1128	0.0018	333	0.1454	-0.0032	0.1024	-0.0111
276	0.1209	-0.0025	0.1099	0.0008	334	0.1458	-0.0033	0.1077	-0.0197
277	0.1213	-0.0025	0.1055	0.0014	335	0.1462	-0.0034	0.1098	-0.0224
278	0.1217	-0.0025	0.1069	0.0017	336	0.1466	-0.0034	0.1062	-0.0138
279	0.1222	-0.0025	0.1113	0.0020	337	0.1471	-0.0035	0.0976	-0.0118
280	0.1226	-0.0025	0.1053	0.0019	338	0.1474	-0.0035	0.0932	-0.0090
281	0.1230	-0.0025	0.1004	-0.0002	339	0.1478	-0.0036	0.1060	-0.0083
282	0.1234	-0.0025	0.1066	0.0018	340	0.1483	-0.0036	0.1079	-0.0220
283	0.1239	-0.0024	0.1089	0.0017	341	0.1487	-0.0037	0.1010	-0.0223
284	0.1243	-0.0024	0.1042	0.0004	342	0.1491	-0.0038	0.0962	-0.0160
285	0.1247	-0.0024	0.1040	0.0015	343	0.1495	-0.0039	0.0972	-0.0154
286	0.1251	-0.0024	0.1070	0.0027	344	0.1499	-0.0039	0.1022	-0.0082
287	0.1256	-0.0024	0.1078	0.0034	345	0.1503	-0.0039	0.1052	-0.0185
288	0.1260	-0.0024	0.1083	0.0009	346	0.1507	-0.0040	0.1055	-0.0243
289	0.1264	-0.0024	0.1104	0.0005	347	0.1511	-0.0041	0.0982	-0.0136
290	0.1269	-0.0024	0.1078	0.0018	348	0.1515	-0.0042	0.0951	-0.0096
291	0.1273	-0.0024	0.1053	0.0014	349	0.1519	-0.0042	0.1047	-0.0077
292	0.1277	-0.0024	0.1002	0.0014	350	0.1523	-0.0042	0.1080	-0.0071
293	0.1281	-0.0024	0.0978	-0.0008	351	0.1527	-0.0042	0.1073	-0.0189
294	0.1285	-0.0024	0.1059	0.0003	352	0.1532	-0.0044	0.1011	-0.0257
295	0.1289	-0.0024	0.1097	0.0031	353	0.1535	-0.0045	0.0958	-0.0173
296	0.1294	-0.0024	0.1037	0.0020	354	0.1539	-0.0045	0.1054	-0.0099
297	0.1298	-0.0024	0.1015	0.0001	355	0.1544	-0.0045	0.1076	-0.0088
298	0.1302	-0.0024	0.1053	-0.0003	356	0.1548	-0.0046	0.1077	-0.0068
299	0.1306	-0.0024	0.1090	-0.0013	357	0.1553	-0.0046	0.1062	-0.0153
300	0.1310	-0.0024	0.1069	0.0008	358	0.1557	-0.0047	0.1034	-0.0220
301	0.1315	-0.0024	0.1006	0.0004	359	0.1561	-0.0048	0.1110	-0.0121
302	0.1318	-0.0024	0.1104	-0.0012	360	0.1565	-0.0048	0.1104	-0.0073
303	0.1323	-0.0024	0.1166	0.0003	361	0.1570	-0.0048	0.1091	-0.0063
304	0.1328	-0.0024	0.1026	-0.0004	362	0.1574	-0.0048	0.1140	-0.0030
305	0.1332	-0.0024	0.1018	-0.0010	363	0.1579	-0.0048	0.1116	-0.0039
306	0.1336	-0.0024	0.1077	-0.0019	364	0.1583	-0.0049	0.1053	-0.0037
307	0.1340	-0.0024	0.1095	-0.0013	365	0.1587	-0.0049	0.1107	0.0023
308	0.1345	-0.0024	0.1120	-0.0015	366	0.1592	-0.0049	0.1110	0.0004
309	0.1349	-0.0024	0.1098	-0.0021	367	0.1596	-0.0049	0.1074	-0.0005
310	0.1353	-0.0024	0.1101	-0.0025	368	0.1601	-0.0049	0.1158	0.0005
311	0.1358	-0.0024	0.1121	-0.0012	369	0.1605	-0.0049	0.1142	-0.0020
312	0.1362	-0.0024	0.1023	-0.0033	370	0.1610	-0.0049	0.1090	0.0010
313	0.1366	-0.0025	0.1049	-0.0029	371	0.1614	-0.0049	0.1104	0.0036
314	0.1371	-0.0024	0.1136	0.0002	372	0.1619	-0.0049	0.1104	-0.0001
315	0.1375	-0.0025	0.1096	-0.0047	373	0.1623	-0.0049	0.1118	0.0023
316	0.1380	-0.0025	0.1138	-0.0035	374	0.1627	-0.0048	0.1153	0.0029
317	0.1384	-0.0025	0.1174	-0.0014	375	0.1632	-0.0048	0.1129	-0.0003
318	0.1389	-0.0025	0.1072	-0.0032	376	0.1636	-0.0048	-	-

Table B3.6 Raw data of free-rising WD-6.258-SW in SW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	vy	vx	65	0.0449	-0.0054	0.1700	-0.0376
2	0.0007	0.0002	0.1689	0.0328	66	0.0456	-0.0055	0.1686	-0.0360
3	0.0014	0.0003	0.1689	0.0250	67	0.0462	-0.0057	0.1526	-0.0300
4	0.0021	0.0004	0.1694	0.0213	68	0.0468	-0.0058	0.1508	-0.0235
5	0.0027	0.0004	0.1668	0.0168	69	0.0474	-0.0059	0.1461	-0.0346
6	0.0034	0.0005	0.1720	0.0125	70	0.0480	-0.0060	0.1492	-0.0319
7	0.0041	0.0005	0.1725	0.0077	71	0.0486	-0.0061	0.1667	-0.0213
8	0.0048	0.0006	0.1709	0.0031	72	0.0493	-0.0062	0.1708	-0.0254
9	0.0054	0.0006	0.1707	0.0012	73	0.0500	-0.0063	0.1638	-0.0255
10	0.0061	0.0006	0.1727	0.0032	74	0.0507	-0.0064	0.1618	-0.0182
11	0.0068	0.0006	0.1610	0.0051	75	0.0513	-0.0065	0.1555	-0.0092
12	0.0074	0.0006	0.1565	0.0126	76	0.0519	-0.0065	0.1522	-0.0065
13	0.0081	0.0007	0.1669	0.0154	77	0.0525	-0.0065	0.1691	-0.0094
14	0.0088	0.0007	0.1713	0.0099	78	0.0533	-0.0066	0.1661	-0.0183
15	0.0095	0.0008	0.1704	0.0048	79	0.0538	-0.0067	0.1536	-0.0221
16	0.0101	0.0008	0.1729	0.0003	80	0.0545	-0.0067	0.1611	-0.0107
17	0.0108	0.0008	0.1789	0.0003	81	0.0551	-0.0068	0.1683	-0.0060
18	0.0116	0.0008	0.1738	0.0035	82	0.0558	-0.0068	0.1714	-0.0049
19	0.0122	0.0008	0.1708	0.0017	83	0.0565	-0.0068	0.1727	-0.0004
20	0.0129	0.0008	0.1723	-0.0061	84	0.0572	-0.0068	0.1755	0.0017
21	0.0136	0.0007	0.1670	-0.0063	85	0.0579	-0.0068	0.1716	0.0014
22	0.0143	0.0007	0.1666	-0.0040	86	0.0586	-0.0068	0.1725	0.0013
23	0.0149	0.0007	0.1642	-0.0030	87	0.0593	-0.0068	0.1803	0.0014
24	0.0156	0.0007	0.1661	-0.0028	88	0.0600	-0.0068	0.1780	0.0029
25	0.0163	0.0007	0.1733	-0.0044	89	0.0607	-0.0068	0.1770	0.0044
26	0.0170	0.0007	0.1752	-0.0048	90	0.0614	-0.0067	0.1806	-0.0002
27	0.0177	0.0007	0.1737	-0.0072	91	0.0622	-0.0068	0.1894	0.0018
28	0.0184	0.0006	0.1865	-0.0196	92	0.0630	-0.0067	0.1979	0.0075
29	0.0192	0.0005	0.1937	-0.0281	93	0.0637	-0.0067	0.1963	0.0037
30	0.0199	0.0004	0.1864	-0.0232	94	0.0645	-0.0067	0.1998	0.0032
31	0.0207	0.0003	0.1844	-0.0169	95	0.0653	-0.0067	0.1943	0.0035
32	0.0214	0.0003	0.1855	-0.0195	96	0.0661	-0.0067	0.1865	0.0023
33	0.0221	0.0002	0.1950	-0.0306	97	0.0668	-0.0067	0.1941	0.0006
34	0.0229	0.0000	0.1934	-0.0302	98	0.0676	-0.0067	0.2012	0.0002
35	0.0237	-0.0001	0.1921	-0.0260	99	0.0684	-0.0067	0.1982	0.0015
36	0.0245	-0.0002	0.1849	-0.0319	100	0.0692	-0.0066	0.1977	-0.0032
37	0.0252	-0.0003	0.1859	-0.0388	101	0.0700	-0.0067	0.2018	-0.0039
38	0.0260	-0.0005	0.1930	-0.0442	102	0.0708	-0.0067	0.1990	-0.0024
39	0.0267	-0.0007	0.1964	-0.0408	103	0.0716	-0.0067	0.1904	-0.0065
40	0.0275	-0.0008	0.1935	-0.0449	104	0.0724	-0.0067	0.1965	-0.0052
41	0.0283	-0.0011	0.1931	-0.0423	105	0.0732	-0.0067	0.2086	-0.0048
42	0.0291	-0.0012	0.1929	-0.0361	106	0.0740	-0.0068	0.2059	-0.0039
43	0.0298	-0.0013	0.1929	-0.0518	107	0.0748	-0.0068	0.1944	-0.0001
44	0.0306	-0.0016	0.1984	-0.0509	108	0.0756	-0.0068	0.1834	-0.0026
45	0.0314	-0.0018	0.1903	-0.0406	109	0.0763	-0.0068	0.1826	-0.0046
46	0.0321	-0.0019	0.1907	-0.0491	110	0.0770	-0.0068	0.2014	-0.0120
47	0.0329	-0.0021	0.1755	-0.0566	111	0.0779	-0.0069	0.1986	-0.0229
48	0.0336	-0.0024	0.1724	-0.0507	112	0.0786	-0.0070	0.1800	-0.0208
49	0.0343	-0.0026	0.1817	-0.0586	113	0.0794	-0.0071	0.1835	-0.0148
50	0.0350	-0.0028	0.1620	-0.0659	114	0.0801	-0.0071	0.1822	-0.0071
51	0.0356	-0.0031	0.1593	-0.0620	115	0.0808	-0.0071	0.1811	0.0011
52	0.0363	-0.0033	0.1775	-0.0626	116	0.0815	-0.0071	0.1785	0.0018
53	0.0370	-0.0036	0.1634	-0.0614	117	0.0822	-0.0071	0.1742	0.0004
54	0.0376	-0.0038	0.1665	-0.0531	118	0.0829	-0.0071	0.1742	0.0013
55	0.0383	-0.0040	0.1804	-0.0452	119	0.0836	-0.0071	0.1713	0.0022
56	0.0390	-0.0042	0.1542	-0.0438	120	0.0843	-0.0071	0.1725	0.0014
57	0.0396	-0.0044	0.1438	-0.0375	121	0.0850	-0.0071	0.1733	0.0003
58	0.0402	-0.0045	0.1788	-0.0287	122	0.0857	-0.0071	0.1692	-0.0028
59	0.0410	-0.0046	0.1731	-0.0320	123	0.0864	-0.0071	0.1681	-0.0036
60	0.0416	-0.0047	0.1620	-0.0337	124	0.0870	-0.0071	0.1665	-0.0039
61	0.0423	-0.0049	0.1644	-0.0334	125	0.0877	-0.0071	0.1628	-0.0054
62	0.0429	-0.0050	0.1515	-0.0335	126	0.0883	-0.0071	0.1627	-0.0066
63	0.0435	-0.0051	0.1729	-0.0282	127	0.0890	-0.0072	0.1628	-0.0052
64	0.0443	-0.0052	0.1726	-0.0348	128	0.0896	-0.0072	0.1625	-0.0034

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0903	-0.0072	0.1638	-0.0026	195	0.1390	-0.0019	0.1743	0.0635
130	0.0910	-0.0072	0.1659	-0.0030	196	0.1398	-0.0016	0.1735	0.0625
131	0.0916	-0.0072	0.1632	-0.0148	197	0.1404	-0.0014	0.1722	0.0700
132	0.0923	-0.0073	0.1514	-0.0219	198	0.1411	-0.0011	0.1853	0.0690
133	0.0928	-0.0074	0.1483	-0.0166	199	0.1419	-0.0008	0.1905	0.0612
134	0.0935	-0.0075	0.1575	-0.0127	200	0.1427	-0.0006	0.1856	0.0611
135	0.0941	-0.0075	0.1640	-0.0097	201	0.1434	-0.0003	0.1799	0.0614
136	0.0948	-0.0075	0.1641	-0.0085	202	0.1441	-0.0001	0.1799	0.0575
137	0.0954	-0.0076	0.1641	-0.0199	203	0.1448	0.0001	0.1821	0.0554
138	0.0961	-0.0077	0.1684	-0.0234	204	0.1455	0.0003	0.1893	0.0540
139	0.0968	-0.0078	0.1695	-0.0123	205	0.1464	0.0005	0.1930	0.0508
140	0.0974	-0.0078	0.1707	-0.0087	206	0.1471	0.0007	0.1865	0.0511
141	0.0981	-0.0078	0.1713	-0.0076	207	0.1478	0.0010	0.1871	0.0503
142	0.0988	-0.0079	0.1710	-0.0067	208	0.1486	0.0011	0.1986	0.0454
143	0.0995	-0.0079	0.1694	-0.0073	209	0.1494	0.0013	0.2033	0.0491
144	0.1002	-0.0079	0.1707	-0.0177	210	0.1502	0.0015	0.1925	0.0452
145	0.1009	-0.0080	0.1749	-0.0239	211	0.1510	0.0017	0.1953	0.0364
146	0.1016	-0.0081	0.1785	-0.0151	212	0.1518	0.0018	0.2008	0.0355
147	0.1023	-0.0081	0.1779	-0.0101	213	0.1526	0.0020	0.2005	0.0377
148	0.1030	-0.0082	0.1749	-0.0065	214	0.1534	0.0021	0.2044	0.0317
149	0.1037	-0.0082	0.1759	-0.0042	215	0.1542	0.0022	0.2052	0.0212
150	0.1044	-0.0082	0.1758	-0.0025	216	0.1550	0.0023	0.2074	0.0251
151	0.1051	-0.0082	0.1794	0.0014	217	0.1559	0.0024	0.2109	0.0244
152	0.1058	-0.0082	0.1799	0.0009	218	0.1567	0.0025	0.2146	0.0137
153	0.1065	-0.0082	0.1847	0.0008	219	0.1576	0.0025	0.2097	0.0048
154	0.1073	-0.0082	0.2006	0.0025	220	0.1584	0.0025	0.1985	0.0010
155	0.1081	-0.0082	0.1983	0.0022	221	0.1592	0.0025	0.2065	-0.0041
156	0.1089	-0.0082	0.1856	0.0036	222	0.1600	0.0025	0.2091	-0.0071
157	0.1096	-0.0082	0.1958	0.0044	223	0.1609	0.0025	0.2057	-0.0084
158	0.1105	-0.0082	0.2025	0.0036	224	0.1617	0.0024	0.2008	-0.0137
159	0.1112	-0.0081	0.2048	0.0063	225	0.1625	0.0024	0.1954	-0.0151
160	0.1121	-0.0081	0.2059	0.0051	226	0.1632	0.0023	0.2011	-0.0197
161	0.1129	-0.0081	0.1974	0.0043	227	0.1641	0.0022	0.2010	-0.0376
162	0.1137	-0.0081	0.2056	0.0071	228	0.1649	0.0020	0.2007	-0.0418
163	0.1145	-0.0080	0.2084	0.0078	229	0.1657	0.0019	0.2036	-0.0381
164	0.1153	-0.0080	0.1995	0.0090	230	0.1665	0.0017	0.2029	-0.0344
165	0.1161	-0.0080	0.2049	0.0078	231	0.1673	0.0016	0.2035	-0.0296
166	0.1170	-0.0079	0.2083	0.0097	232	0.1681	0.0015	0.2052	-0.0362
167	0.1178	-0.0079	0.2095	0.0226	233	0.1689	0.0013	0.1982	-0.0316
168	0.1187	-0.0078	0.2107	0.0287	234	0.1697	0.0012	0.1972	-0.0320
169	0.1195	-0.0077	0.2102	0.0244	235	0.1705	0.0011	0.1911	-0.0389
170	0.1203	-0.0076	0.2088	0.0223	236	0.1712	0.0009	0.1835	-0.0461
171	0.1211	-0.0075	0.2072	0.0343	237	0.1720	0.0007	0.1890	-0.0501
172	0.1220	-0.0073	0.2095	0.0375	238	0.1727	0.0005	0.2003	-0.0527
173	0.1228	-0.0072	0.2122	0.0353	239	0.1736	0.0003	0.1889	-0.0591
174	0.1237	-0.0070	0.2044	0.0377	240	0.1743	0.0000	0.1685	-0.0586
175	0.1245	-0.0069	0.1928	0.0388	241	0.1749	-0.0002	0.1708	-0.0654
176	0.1252	-0.0067	0.2030	0.0488	242	0.1756	-0.0005	0.1680	-0.0751
177	0.1261	-0.0065	0.1999	0.0530	243	0.1763	-0.0008	0.1775	-0.0751
178	0.1268	-0.0063	0.1923	0.0557	244	0.1770	-0.0011	0.1767	-0.0722
179	0.1276	-0.0060	0.2026	0.0555	245	0.1777	-0.0014	0.1648	-0.0702
180	0.1285	-0.0058	0.1907	0.0561	246	0.1784	-0.0017	0.1647	-0.0728
181	0.1291	-0.0056	0.1800	0.0591	247	0.1790	-0.0020	0.1665	-0.0786
182	0.1299	-0.0054	0.1849	0.0614	248	0.1797	-0.0023	0.1675	-0.0803
183	0.1306	-0.0051	0.1872	0.0619	249	0.1803	-0.0026	0.1668	-0.0818
184	0.1314	-0.0049	0.1912	0.0636	250	0.1810	-0.0029	0.1668	-0.0802
185	0.1322	-0.0046	0.1884	0.0611	251	0.1817	-0.0032	0.1660	-0.0831
186	0.1329	-0.0044	0.1809	0.0618	252	0.1824	-0.0036	0.1686	-0.0842
187	0.1336	-0.0041	0.1743	0.0728	253	0.1830	-0.0039	0.1673	-0.0839
188	0.1343	-0.0038	0.1708	0.0731	254	0.1837	-0.0043	0.1679	-0.0858
189	0.1350	-0.0035	0.1707	0.0692	255	0.1844	-0.0046	0.1704	-0.0869
190	0.1357	-0.0032	0.1720	0.0653	256	0.1851	-0.0050	0.1683	-0.0831
191	0.1363	-0.0030	0.1702	0.0656	257	0.1857	-0.0053	0.1698	-0.0829
192	0.1370	-0.0027	0.1694	0.0705	258	0.1864	-0.0056	0.1700	-0.0835
193	0.1377	-0.0024	0.1676	0.0698	259	0.1871	-0.0059	0.1682	-0.0833
194	0.1384	-0.0022	0.1678	0.0677	260	0.1878	-0.0063	0.1695	-0.0819

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
261	0.1884	-0.0066	0.1729	-0.0817	286	0.2084	-0.0111	0.2190	-0.0002
262	0.1891	-0.0069	0.1726	-0.0785	287	0.2093	-0.0111	0.2164	0.0032
263	0.1898	-0.0072	0.1728	-0.0769	288	0.2102	-0.0111	0.2033	0.0031
264	0.1905	-0.0076	0.1827	-0.0799	289	0.2109	-0.0111	0.1917	0.0126
265	0.1913	-0.0079	0.1810	-0.0649	290	0.2117	-0.0110	0.2247	0.0229
266	0.1920	-0.0081	0.1872	-0.0636	291	0.2127	-0.0109	0.2238	0.0286
267	0.1928	-0.0084	0.2001	-0.0653	292	0.2135	-0.0108	0.1892	0.0268
268	0.1936	-0.0086	0.1973	-0.0648	293	0.2142	-0.0107	0.2090	0.0300
269	0.1944	-0.0089	0.2018	-0.0628	294	0.2152	-0.0105	0.2149	0.0347
270	0.1952	-0.0091	0.1949	-0.0532	295	0.2160	-0.0104	0.2038	0.0396
271	0.1959	-0.0093	0.1857	-0.0608	296	0.2168	-0.0102	0.1934	0.0430
272	0.1967	-0.0096	0.1940	-0.0610	297	0.2175	-0.0100	0.1931	0.0362
273	0.1975	-0.0098	0.2057	-0.0475	298	0.2183	-0.0099	0.1903	0.0416
274	0.1983	-0.0100	0.2142	-0.0492	299	0.2190	-0.0097	0.1713	0.0409
275	0.1992	-0.0102	0.2037	-0.0478	300	0.2197	-0.0096	0.1669	0.0499
276	0.1999	-0.0104	0.1985	-0.0429	301	0.2204	-0.0093	0.1618	0.0500
277	0.2008	-0.0105	0.2137	-0.0303	302	0.2210	-0.0092	0.1602	0.0403
278	0.2017	-0.0106	0.2095	-0.0235	303	0.2216	-0.0090	0.1548	0.0453
279	0.2024	-0.0107	0.2072	-0.0280	304	0.2222	-0.0088	0.1556	0.0547
280	0.2033	-0.0108	0.2153	-0.0180	305	0.2229	-0.0085	0.1714	0.0689
281	0.2042	-0.0109	0.2072	-0.0166	306	0.2236	-0.0083	0.1786	0.0702
282	0.2050	-0.0110	0.2099	-0.0238	307	0.2243	-0.0080	0.1700	0.0682
283	0.2058	-0.0111	0.2173	-0.0155	308	0.2250	-0.0077	0.1682	0.0745
284	0.2067	-0.0111	0.2137	-0.0022	309	0.2257	-0.0074	0.1718	0.0812
285	0.2076	-0.0111	0.2169	-0.0035	310	0.2264	-0.0071	-	-

Table B3.7 Raw data of free-rising EPS-2.395-SW in SW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0419	-0.0023	0.1601	-0.0791
2	0.0007	0.0002	0.1608	0.0697	66	0.0425	-0.0027	0.1673	-0.0678
3	0.0013	0.0006	0.1653	0.0693	67	0.0432	-0.0029	0.1738	-0.0469
4	0.0020	0.0007	0.1855	0.0438	68	0.0439	-0.0031	0.1805	-0.0536
5	0.0028	0.0009	0.1784	0.0518	69	0.0447	-0.0033	0.1798	-0.0373
6	0.0034	0.0011	0.1732	0.0384	70	0.0454	-0.0034	0.1799	-0.0183
7	0.0042	0.0012	0.1923	0.0276	71	0.0461	-0.0034	0.1816	-0.0190
8	0.0050	0.0014	0.2067	0.0204	72	0.0468	-0.0035	0.1809	0.0005
9	0.0058	0.0014	0.2116	0.0021	73	0.0475	-0.0034	0.1972	0.0280
10	0.0067	0.0014	0.2102	-0.0052	74	0.0484	-0.0033	0.1947	0.0465
11	0.0075	0.0013	0.2002	-0.0156	75	0.0491	-0.0031	0.1724	0.0482
12	0.0083	0.0013	0.1913	-0.0334	76	0.0498	-0.0029	0.1690	0.0641
13	0.0090	0.0011	0.1922	-0.0622	77	0.0505	-0.0026	0.1620	0.0816
14	0.0098	0.0008	0.1825	-0.0644	78	0.0511	-0.0022	0.1481	0.0808
15	0.0105	0.0006	0.1687	-0.0584	79	0.0516	-0.0019	0.1442	0.0880
16	0.0111	0.0003	0.1602	-0.0705	80	0.0522	-0.0015	0.1396	0.0826
17	0.0118	0.0000	0.1504	-0.0811	81	0.0528	-0.0013	0.1363	0.0866
18	0.0123	-0.0004	0.1446	-0.0796	82	0.0533	-0.0008	0.1646	0.0790
19	0.0129	-0.0006	0.1390	-0.0753	83	0.0541	-0.0006	0.1622	0.0688
20	0.0135	-0.0010	0.1422	-0.0757	84	0.0546	-0.0003	0.1429	0.0685
21	0.0141	-0.0013	0.1487	-0.0720	85	0.0552	-0.0001	0.1633	0.0749
22	0.0146	-0.0015	0.1519	-0.0760	86	0.0559	0.0003	0.1673	0.0762
23	0.0153	-0.0019	0.1519	-0.0645	87	0.0566	0.0005	0.1664	0.0499
24	0.0159	-0.0021	0.1655	-0.0490	88	0.0572	0.0007	0.1795	0.0542
25	0.0166	-0.0023	0.1841	-0.0540	89	0.0580	0.0010	0.1791	0.0477
26	0.0173	-0.0025	0.1846	-0.0459	90	0.0587	0.0011	0.1742	0.0183
27	0.0181	-0.0026	0.1889	-0.0346	91	0.0594	0.0011	0.1816	0.0053
28	0.0188	-0.0028	0.1994	-0.0277	92	0.0601	0.0011	0.1902	-0.0016
29	0.0197	-0.0028	0.1975	-0.0036	93	0.0609	0.0011	0.1968	-0.0124
30	0.0204	-0.0028	0.1943	0.0130	94	0.0617	0.0010	0.1943	-0.0215
31	0.0212	-0.0027	0.2007	0.0129	95	0.0625	0.0009	0.1817	-0.0414
32	0.0220	-0.0027	0.1993	0.0185	96	0.0632	0.0007	0.1644	-0.0669
33	0.0228	-0.0026	0.1898	0.0261	97	0.0638	0.0004	0.1558	-0.0740
34	0.0236	-0.0025	0.1719	0.0562	98	0.0644	0.0001	0.1509	-0.0807
35	0.0242	-0.0021	0.1661	0.0692	99	0.0650	-0.0002	0.1409	-0.0833
36	0.0249	-0.0019	0.1569	0.0781	100	0.0655	-0.0006	0.1347	-0.0835
37	0.0254	-0.0015	0.1374	0.0840	101	0.0661	-0.0009	0.1300	-0.0857
38	0.0260	-0.0013	0.1221	0.0848	102	0.0666	-0.0012	0.1280	-0.0814
39	0.0264	-0.0008	0.1210	0.0866	103	0.0671	-0.0016	0.1361	-0.0763
40	0.0270	-0.0006	0.1211	0.0854	104	0.0677	-0.0019	0.1430	-0.0816
41	0.0274	-0.0002	0.1075	0.0857	105	0.0682	-0.0022	0.1506	-0.0722
42	0.0278	0.0001	0.1311	0.0685	106	0.0689	-0.0024	0.1589	-0.0635
43	0.0284	0.0004	0.1538	0.0560	107	0.0695	-0.0027	0.1670	-0.0664
44	0.0290	0.0006	0.1466	0.0349	108	0.0702	-0.0030	0.1744	-0.0456
45	0.0296	0.0007	0.1444	0.0601	109	0.0709	-0.0031	0.1809	-0.0392
46	0.0302	0.0011	0.1489	0.0670	110	0.0716	-0.0033	0.1851	-0.0383
47	0.0308	0.0012	0.1543	0.0338	111	0.0724	-0.0034	0.1884	-0.0203
48	0.0314	0.0013	0.1646	0.0242	112	0.0732	-0.0034	0.1981	-0.0028
49	0.0321	0.0014	0.1754	0.0136	113	0.0740	-0.0034	0.1935	0.0054
50	0.0328	0.0014	0.1727	0.0079	114	0.0747	-0.0034	0.1837	0.0189
51	0.0335	0.0015	0.1778	-0.0024	115	0.0754	-0.0033	0.1918	0.0431
52	0.0343	0.0014	0.1788	-0.0252	116	0.0762	-0.0031	0.1890	0.0457
53	0.0349	0.0013	0.1720	-0.0350	117	0.0769	-0.0029	0.1758	0.0508
54	0.0356	0.0011	0.1638	-0.0461	118	0.0776	-0.0026	0.1693	0.0718
55	0.0362	0.0009	0.1498	-0.0721	119	0.0783	-0.0023	0.1568	0.0717
56	0.0368	0.0006	0.1522	-0.0743	120	0.0789	-0.0021	0.1507	0.0755
57	0.0375	0.0003	0.1511	-0.0774	121	0.0795	-0.0017	0.1464	0.0838
58	0.0380	-0.0001	0.1417	-0.0885	122	0.0801	-0.0014	0.1344	0.0772
59	0.0386	-0.0004	0.1299	-0.0876	123	0.0806	-0.0011	0.1319	0.0740
60	0.0391	-0.0008	0.1262	-0.0830	124	0.0811	-0.0008	0.1382	0.0726
61	0.0396	-0.0011	0.1326	-0.0818	125	0.0817	-0.0005	0.1507	0.0650
62	0.0401	-0.0014	0.1330	-0.0839	126	0.0823	-0.0003	0.1604	0.0600
63	0.0407	-0.0017	0.1391	-0.0790	127	0.0830	0.0000	0.1670	0.0622
64	0.0413	-0.0020	0.1511	-0.0737	128	0.0837	0.0002	0.1760	0.0543

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0844	0.0004	0.1786	0.0425	195	0.1290	-0.0043	0.1942	-0.0169
130	0.0851	0.0005	0.1763	0.0306	196	0.1298	-0.0044	0.1991	0.0009
131	0.0858	0.0006	0.1787	0.0243	197	0.1306	-0.0043	0.1975	0.0149
132	0.0865	0.0007	0.1938	0.0154	198	0.1314	-0.0042	0.1966	0.0304
133	0.0873	0.0008	0.2078	-0.0039	199	0.1322	-0.0041	0.1875	0.0509
134	0.0882	0.0007	0.2025	-0.0111	200	0.1329	-0.0038	0.1730	0.0647
135	0.0890	0.0007	0.1925	-0.0239	201	0.1336	-0.0036	0.1640	0.0627
136	0.0897	0.0005	0.1887	-0.0439	202	0.1342	-0.0033	0.1569	0.0691
137	0.0905	0.0003	0.1772	-0.0604	203	0.1348	-0.0030	0.1438	0.0771
138	0.0911	0.0000	0.1698	-0.0662	204	0.1353	-0.0027	0.1286	0.0790
139	0.0918	-0.0002	0.1666	-0.0751	205	0.1358	-0.0024	0.1322	0.0782
140	0.0925	-0.0006	0.1614	-0.0848	206	0.1364	-0.0021	0.1405	0.0770
141	0.0931	-0.0009	0.1514	-0.0832	207	0.1370	-0.0018	0.1429	0.0694
142	0.0937	-0.0012	0.1344	-0.0829	208	0.1375	-0.0015	0.1433	0.0594
143	0.0942	-0.0016	0.1289	-0.0740	209	0.1381	-0.0013	0.1480	0.0680
144	0.0947	-0.0018	0.1324	-0.0784	210	0.1387	-0.0010	0.1511	0.0679
145	0.0953	-0.0022	0.1441	-0.0718	211	0.1393	-0.0008	0.1587	0.0575
146	0.0959	-0.0024	0.1544	-0.0612	212	0.1400	-0.0005	0.1725	0.0497
147	0.0965	-0.0027	0.1631	-0.0657	213	0.1407	-0.0004	0.1796	0.0396
148	0.0972	-0.0029	0.1725	-0.0568	214	0.1414	-0.0002	0.1818	0.0275
149	0.0979	-0.0031	0.1712	-0.0516	215	0.1422	-0.0001	0.1919	0.0117
150	0.0985	-0.0033	0.1771	-0.0523	216	0.1430	-0.0001	0.1961	0.0073
151	0.0993	-0.0035	0.1815	-0.0446	217	0.1437	-0.0001	0.1898	0.0031
152	0.1000	-0.0037	0.1760	-0.0251	218	0.1445	-0.0001	0.1907	-0.0240
153	0.1007	-0.0037	0.1803	-0.0181	219	0.1453	-0.0003	0.1931	-0.0434
154	0.1014	-0.0038	0.1855	-0.0098	220	0.1460	-0.0004	0.1836	-0.0543
155	0.1022	-0.0038	0.1834	0.0073	221	0.1467	-0.0007	0.1734	-0.0675
156	0.1029	-0.0038	0.1922	0.0175	222	0.1474	-0.0010	0.1658	-0.0732
157	0.1037	-0.0037	0.1917	0.0286	223	0.1480	-0.0013	0.1548	-0.0813
158	0.1044	-0.0036	0.1767	0.0364	224	0.1487	-0.0016	0.1503	-0.0902
159	0.1051	-0.0034	0.1681	0.0561	225	0.1492	-0.0020	0.1497	-0.0802
160	0.1058	-0.0031	0.1602	0.0644	226	0.1498	-0.0023	0.1396	-0.0801
161	0.1064	-0.0029	0.1507	0.0627	227	0.1504	-0.0027	0.1330	-0.0854
162	0.1070	-0.0026	0.1449	0.0736	228	0.1509	-0.0030	0.1393	-0.0803
163	0.1076	-0.0023	0.1371	0.0723	229	0.1515	-0.0033	0.1475	-0.0814
164	0.1081	-0.0020	0.1402	0.0755	230	0.1521	-0.0036	0.1590	-0.0694
165	0.1087	-0.0017	0.1472	0.0784	231	0.1528	-0.0038	0.1667	-0.0592
166	0.1093	-0.0014	0.1426	0.0740	232	0.1534	-0.0041	0.1754	-0.0575
167	0.1098	-0.0011	0.1502	0.0685	233	0.1542	-0.0043	0.1829	-0.0503
168	0.1105	-0.0008	0.1560	0.0604	234	0.1549	-0.0045	0.1875	-0.0357
169	0.1111	-0.0006	0.1622	0.0614	235	0.1557	-0.0046	0.1956	-0.0275
170	0.1118	-0.0004	0.1768	0.0573	236	0.1565	-0.0047	0.2015	-0.0190
171	0.1125	-0.0002	0.1801	0.0410	237	0.1573	-0.0047	0.2029	-0.0020
172	0.1132	0.0000	0.1817	0.0379	238	0.1581	-0.0047	0.2028	0.0183
173	0.1139	0.0001	0.1876	0.0236	239	0.1589	-0.0046	0.2006	0.0327
174	0.1147	0.0002	0.1968	0.0124	240	0.1597	-0.0045	0.1905	0.0495
175	0.1155	0.0002	0.1967	0.0148	241	0.1604	-0.0042	0.1752	0.0600
176	0.1163	0.0003	0.1982	-0.0096	242	0.1611	-0.0040	0.1632	0.0648
177	0.1171	0.0002	0.2032	-0.0357	243	0.1617	-0.0037	0.1519	0.0800
178	0.1179	0.0000	0.1933	-0.0480	244	0.1623	-0.0033	0.1477	0.0815
179	0.1187	-0.0002	0.1795	-0.0574	245	0.1629	-0.0030	0.1485	0.0784
180	0.1193	-0.0005	0.1671	-0.0721	246	0.1635	-0.0027	0.1506	0.0821
181	0.1200	-0.0008	0.1589	-0.0827	247	0.1641	-0.0024	0.1427	0.0851
182	0.1206	-0.0011	0.1523	-0.0764	248	0.1646	-0.0020	0.1359	0.0812
183	0.1212	-0.0014	0.1378	-0.0715	249	0.1652	-0.0017	0.1446	0.0769
184	0.1217	-0.0017	0.1347	-0.0798	250	0.1658	-0.0014	0.1521	0.0762
185	0.1223	-0.0020	0.1430	-0.0773	251	0.1664	-0.0011	0.1612	0.0713
186	0.1229	-0.0023	0.1419	-0.0762	252	0.1671	-0.0008	0.1670	0.0648
187	0.1234	-0.0026	0.1452	-0.0778	253	0.1677	-0.0006	0.1732	0.0564
188	0.1240	-0.0029	0.1536	-0.0768	254	0.1685	-0.0004	0.1857	0.0468
189	0.1246	-0.0033	0.1645	-0.0746	255	0.1692	-0.0002	0.1938	0.0388
190	0.1253	-0.0035	0.1678	-0.0637	256	0.1700	-0.0001	0.1996	0.0333
191	0.1260	-0.0038	0.1754	-0.0560	257	0.1708	0.0000	0.1991	0.0161
192	0.1267	-0.0040	0.1843	-0.0453	258	0.1716	0.0000	0.2027	-0.0011
193	0.1275	-0.0041	0.1873	-0.0294	259	0.1724	0.0000	0.2028	-0.0110
194	0.1282	-0.0042	0.1931	-0.0252	260	0.1732	0.0000	0.1993	-0.0289

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
261	0.1740	-0.0002	0.1959	-0.0452	317	0.2117	-0.0043	0.1823	-0.0323
262	0.1748	-0.0004	0.1808	-0.0559	318	0.2124	-0.0044	0.1854	-0.0187
263	0.1755	-0.0006	0.1705	-0.0674	319	0.2132	-0.0044	0.1900	-0.0086
264	0.1762	-0.0009	0.1624	-0.0806	320	0.2139	-0.0044	0.1992	0.0094
265	0.1768	-0.0013	0.1525	-0.0845	321	0.2148	-0.0044	0.1987	0.0233
266	0.1774	-0.0016	0.1432	-0.0795	322	0.2155	-0.0043	0.1839	0.0339
267	0.1779	-0.0019	0.1370	-0.0794	323	0.2163	-0.0041	0.1791	0.0466
268	0.1785	-0.0023	0.1393	-0.0794	324	0.2170	-0.0039	0.1749	0.0577
269	0.1790	-0.0026	0.1541	-0.0751	325	0.2177	-0.0036	0.1658	0.0716
270	0.1797	-0.0029	0.1550	-0.0723	326	0.2183	-0.0033	0.1480	0.0813
271	0.1803	-0.0031	0.1486	-0.0657	327	0.2188	-0.0030	0.1356	0.0748
272	0.1809	-0.0034	0.1635	-0.0640	328	0.2194	-0.0027	0.1324	0.0713
273	0.1816	-0.0036	0.1743	-0.0570	329	0.2199	-0.0024	0.1355	0.0771
274	0.1823	-0.0038	0.1781	-0.0447	330	0.2205	-0.0021	0.1455	0.0794
275	0.1830	-0.0040	0.1848	-0.0417	331	0.2211	-0.0018	0.1435	0.0779
276	0.1838	-0.0042	0.1896	-0.0335	332	0.2216	-0.0015	0.1499	0.0723
277	0.1845	-0.0043	0.2004	-0.0162	333	0.2223	-0.0012	0.1563	0.0655
278	0.1854	-0.0043	0.2093	-0.0049	334	0.2229	-0.0010	0.1573	0.0596
279	0.1862	-0.0043	0.2070	0.0082	335	0.2235	-0.0007	0.1753	0.0537
280	0.1870	-0.0042	0.2015	0.0261	336	0.2243	-0.0005	0.1810	0.0428
281	0.1878	-0.0041	0.1863	0.0433	337	0.2250	-0.0004	0.1828	0.0401
282	0.1885	-0.0039	0.1861	0.0554	338	0.2257	-0.0002	0.1908	0.0247
283	0.1893	-0.0037	0.1844	0.0644	339	0.2265	-0.0002	0.1971	0.0020
284	0.1900	-0.0034	0.1684	0.0802	340	0.2273	-0.0002	0.2009	-0.0043
285	0.1907	-0.0030	0.1578	0.0796	341	0.2281	-0.0002	0.1929	-0.0191
286	0.1913	-0.0027	0.1534	0.0876	342	0.2288	-0.0003	0.1951	-0.0301
287	0.1919	-0.0023	0.1405	0.0861	343	0.2297	-0.0004	0.1968	-0.0384
288	0.1924	-0.0020	0.1314	0.0762	344	0.2304	-0.0006	0.1866	-0.0551
289	0.1929	-0.0017	0.1367	0.0833	345	0.2312	-0.0009	0.1695	-0.0733
290	0.1935	-0.0014	0.1430	0.0828	346	0.2318	-0.0012	0.1529	-0.0815
291	0.1941	-0.0011	0.1575	0.0752	347	0.2324	-0.0015	0.1529	-0.0872
292	0.1947	-0.0008	0.1640	0.0665	348	0.2330	-0.0019	0.1487	-0.0938
293	0.1954	-0.0005	0.1705	0.0608	349	0.2336	-0.0023	0.1424	-0.0839
294	0.1961	-0.0003	0.1761	0.0533	350	0.2341	-0.0026	0.1383	-0.0844
295	0.1968	-0.0001	0.1778	0.0450	351	0.2347	-0.0030	0.1405	-0.0840
296	0.1975	0.0001	0.1834	0.0366	352	0.2353	-0.0033	0.1561	-0.0812
297	0.1983	0.0002	0.1895	0.0199	353	0.2359	-0.0036	0.1653	-0.0760
298	0.1990	0.0002	0.2047	0.0097	354	0.2366	-0.0039	0.1652	-0.0727
299	0.1999	0.0003	0.2049	0.0074	355	0.2372	-0.0042	0.1645	-0.0754
300	0.2007	0.0003	0.1917	-0.0156	356	0.2379	-0.0045	0.1694	-0.0567
301	0.2014	0.0002	0.1921	-0.0362	357	0.2386	-0.0047	0.1825	-0.0508
302	0.2022	0.0000	0.1890	-0.0490	358	0.2394	-0.0049	0.1937	-0.0486
303	0.2030	-0.0002	0.1787	-0.0651	359	0.2401	-0.0050	0.1994	-0.0258
304	0.2036	-0.0005	0.1658	-0.0760	360	0.2410	-0.0051	0.2043	-0.0090
305	0.2043	-0.0008	0.1560	-0.0874	361	0.2418	-0.0051	0.2056	0.0052
306	0.2049	-0.0012	0.1505	-0.0865	362	0.2426	-0.0051	0.2043	0.0165
307	0.2055	-0.0015	0.1417	-0.0871	363	0.2434	-0.0050	0.2035	0.0289
308	0.2060	-0.0019	0.1326	-0.0885	364	0.2442	-0.0048	0.1983	0.0463
309	0.2065	-0.0022	0.1298	-0.0827	365	0.2450	-0.0046	0.1807	0.0601
310	0.2071	-0.0026	0.1357	-0.0816	366	0.2457	-0.0043	0.1642	0.0659
311	0.2076	-0.0029	0.1450	-0.0697	367	0.2463	-0.0041	0.1539	0.0734
312	0.2082	-0.0031	0.1511	-0.0679	368	0.2469	-0.0038	0.1531	0.0815
313	0.2088	-0.0034	0.1665	-0.0682	369	0.2475	-0.0034	0.1568	0.0867
314	0.2096	-0.0037	0.1741	-0.0558	370	0.2482	-0.0031	0.1453	0.0850
315	0.2102	-0.0039	0.1768	-0.0548	371	0.2487	-0.0028	-	-
316	0.2110	-0.0041	0.1841	-0.0489					

Table B3.8 Raw data of free-rising EPS-3.353-SW in SW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0477	-0.0041	0.1899	0.0710
2	0.0006	-0.0004	0.1569	-0.0977	66	0.0484	-0.0039	0.1752	0.0850
3	0.0013	-0.0008	0.1451	-0.0967	67	0.0491	-0.0035	0.1511	0.0914
4	0.0018	-0.0012	0.1430	-0.0916	68	0.0497	-0.0031	0.1455	0.0867
5	0.0024	-0.0015	0.1337	-0.0858	69	0.0503	-0.0028	0.1493	0.0835
6	0.0029	-0.0019	0.1475	-0.0842	70	0.0509	-0.0025	0.1410	0.0843
7	0.0036	-0.0022	0.1682	-0.0743	71	0.0514	-0.0021	0.1334	0.0849
8	0.0042	-0.0025	0.1682	-0.0721	72	0.0519	-0.0018	0.1445	0.0748
9	0.0049	-0.0028	0.1805	-0.0735	73	0.0525	-0.0015	0.1650	0.0720
10	0.0057	-0.0031	0.1851	-0.0693	74	0.0532	-0.0012	0.1733	0.0600
11	0.0064	-0.0033	0.1900	-0.0662	75	0.0539	-0.0010	0.1795	0.0602
12	0.0072	-0.0036	0.1988	-0.0704	76	0.0547	-0.0007	0.1902	0.0633
13	0.0080	-0.0039	0.2085	-0.0536	77	0.0554	-0.0005	0.1927	0.0432
14	0.0089	-0.0040	0.2169	-0.0363	78	0.0562	-0.0004	0.2026	0.0416
15	0.0097	-0.0042	0.2202	-0.0281	79	0.0571	-0.0002	0.2189	0.0384
16	0.0106	-0.0043	0.2151	-0.0206	80	0.0580	-0.0001	0.2251	0.0206
17	0.0115	-0.0043	0.2236	-0.0068	81	0.0589	0.0000	0.2246	0.0072
18	0.0124	-0.0043	0.2251	0.0095	82	0.0598	0.0000	0.2310	-0.0076
19	0.0133	-0.0043	0.2140	0.0229	83	0.0607	-0.0001	0.2375	-0.0250
20	0.0141	-0.0041	0.2123	0.0436	84	0.0617	-0.0002	0.2247	-0.0467
21	0.0150	-0.0039	0.2083	0.0562	85	0.0625	-0.0004	0.2082	-0.0625
22	0.0158	-0.0037	0.1947	0.0671	86	0.0633	-0.0007	0.2017	-0.0750
23	0.0165	-0.0034	0.1747	0.0815	87	0.0641	-0.0010	0.1821	-0.0820
24	0.0172	-0.0030	0.1658	0.0885	88	0.0648	-0.0014	0.1663	-0.0880
25	0.0178	-0.0027	0.1548	0.0881	89	0.0655	-0.0017	0.1618	-0.0878
26	0.0184	-0.0023	0.1473	0.0865	90	0.0661	-0.0021	0.1499	-0.0887
27	0.0190	-0.0020	0.1384	0.0819	91	0.0667	-0.0025	0.1400	-0.0818
28	0.0195	-0.0017	0.1384	0.0744	92	0.0672	-0.0027	0.1373	-0.0717
29	0.0201	-0.0014	0.1538	0.0749	93	0.0678	-0.0030	0.1484	-0.0728
30	0.0208	-0.0011	0.1567	0.0767	94	0.0684	-0.0033	0.1625	-0.0718
31	0.0214	-0.0008	0.1564	0.0709	95	0.0691	-0.0036	0.1698	-0.0789
32	0.0220	-0.0005	0.1765	0.0702	96	0.0697	-0.0039	0.1768	-0.0711
33	0.0228	-0.0002	0.1881	0.0640	97	0.0705	-0.0042	0.1885	-0.0582
34	0.0235	0.0000	0.1888	0.0449	98	0.0713	-0.0044	0.1986	-0.0593
35	0.0243	0.0002	0.2121	0.0404	99	0.0721	-0.0046	0.2023	-0.0556
36	0.0252	0.0003	0.2254	0.0347	100	0.0729	-0.0049	0.2154	-0.0468
37	0.0261	0.0004	0.2200	0.0190	101	0.0738	-0.0050	0.2206	-0.0385
38	0.0270	0.0005	0.2305	-0.0012	102	0.0746	-0.0052	0.2203	-0.0239
39	0.0279	0.0004	0.2376	-0.0217	103	0.0755	-0.0052	0.2341	-0.0084
40	0.0289	0.0003	0.2180	-0.0401	104	0.0765	-0.0052	0.2350	0.0080
41	0.0297	0.0001	0.2053	-0.0556	105	0.0774	-0.0052	0.2226	0.0250
42	0.0305	-0.0001	0.2032	-0.0655	106	0.0783	-0.0050	0.2226	0.0353
43	0.0313	-0.0004	0.1857	-0.0813	107	0.0792	-0.0049	0.2175	0.0504
44	0.0320	-0.0008	0.1746	-0.0832	108	0.0800	-0.0046	0.2019	0.0598
45	0.0327	-0.0011	0.1644	-0.0833	109	0.0808	-0.0044	0.1838	0.0672
46	0.0333	-0.0015	0.1484	-0.0931	110	0.0815	-0.0041	0.1640	0.0784
47	0.0339	-0.0018	0.1363	-0.0846	111	0.0821	-0.0038	0.1521	0.0832
48	0.0344	-0.0021	0.1364	-0.0748	112	0.0827	-0.0034	0.1504	0.0800
49	0.0350	-0.0024	0.1497	-0.0760	113	0.0833	-0.0031	0.1414	0.0827
50	0.0356	-0.0027	0.1464	-0.0738	114	0.0838	-0.0028	0.1310	0.0813
51	0.0362	-0.0030	0.1516	-0.0739	115	0.0844	-0.0025	0.1431	0.0704
52	0.0368	-0.0033	0.1652	-0.0744	116	0.0850	-0.0022	0.1547	0.0623
53	0.0375	-0.0036	0.1740	-0.0760	117	0.0856	-0.0020	0.1675	0.0549
54	0.0382	-0.0039	0.1918	-0.0685	118	0.0863	-0.0018	0.1788	0.0583
55	0.0390	-0.0042	0.2059	-0.0591	119	0.0871	-0.0015	0.1821	0.0627
56	0.0399	-0.0044	0.2132	-0.0554	120	0.0878	-0.0013	0.1853	0.0535
57	0.0407	-0.0046	0.2232	-0.0459	121	0.0885	-0.0011	0.2013	0.0447
58	0.0416	-0.0048	0.2203	-0.0314	122	0.0894	-0.0009	0.2289	0.0393
59	0.0425	-0.0049	0.2269	-0.0131	123	0.0904	-0.0008	0.2286	0.0283
60	0.0435	-0.0049	0.2329	0.0002	124	0.0912	-0.0007	0.2252	0.0147
61	0.0443	-0.0049	0.2193	0.0178	125	0.0922	-0.0006	0.2371	-0.0005
62	0.0452	-0.0047	0.2114	0.0229	126	0.0931	-0.0007	0.2351	-0.0146
63	0.0460	-0.0047	0.2151	0.0391	127	0.0940	-0.0008	0.2253	-0.0327
64	0.0469	-0.0044	0.2064	0.0670	128	0.0949	-0.0009	0.2152	-0.0525

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0958	-0.0012	0.2046	-0.0637	195	0.1458	-0.0051	0.2017	0.0427
130	0.0966	-0.0014	0.1913	-0.0687	196	0.1466	-0.0050	0.1886	0.0457
131	0.0973	-0.0017	0.1754	-0.0780	197	0.1473	-0.0048	0.1760	0.0574
132	0.0980	-0.0021	0.1641	-0.0825	198	0.1480	-0.0045	0.1611	0.0656
133	0.0986	-0.0024	0.1540	-0.0794	199	0.1486	-0.0043	0.1500	0.0586
134	0.0992	-0.0027	0.1509	-0.0775	200	0.1492	-0.0040	0.1457	0.0573
135	0.0998	-0.0030	0.1479	-0.0761	201	0.1498	-0.0038	0.1312	0.0580
136	0.1004	-0.0033	0.1412	-0.0694	202	0.1502	-0.0036	0.1373	0.0471
137	0.1009	-0.0036	0.1485	-0.0703	203	0.1509	-0.0034	0.1383	0.0476
138	0.1016	-0.0039	0.1639	-0.0629	204	0.1513	-0.0032	0.1478	0.0520
139	0.1023	-0.0041	0.1754	-0.0544	205	0.1520	-0.0030	0.1620	0.0455
140	0.1030	-0.0043	0.1850	-0.0621	206	0.1526	-0.0028	0.1746	0.0428
141	0.1037	-0.0046	0.1877	-0.0649	207	0.1534	-0.0027	0.1871	0.0435
142	0.1045	-0.0048	0.1966	-0.0507	208	0.1541	-0.0025	0.1853	0.0364
143	0.1053	-0.0050	0.2173	-0.0411	209	0.1549	-0.0024	0.2048	0.0276
144	0.1062	-0.0052	0.2239	-0.0409	210	0.1558	-0.0023	0.2221	0.0185
145	0.1071	-0.0053	0.2237	-0.0324	211	0.1567	-0.0022	0.2273	0.0060
146	0.1080	-0.0054	0.2363	-0.0159	212	0.1576	-0.0022	0.2317	-0.0033
147	0.1090	-0.0054	0.2372	-0.0037	213	0.1586	-0.0022	0.2332	-0.0144
148	0.1099	-0.0054	0.2211	0.0027	214	0.1595	-0.0023	0.2255	-0.0221
149	0.1108	-0.0054	0.2246	0.0242	215	0.1604	-0.0024	0.2213	-0.0263
150	0.1117	-0.0053	0.2192	0.0334	216	0.1612	-0.0025	0.2105	-0.0430
151	0.1125	-0.0051	0.2049	0.0477	217	0.1620	-0.0028	0.1979	-0.0502
152	0.1133	-0.0049	0.1990	0.0629	218	0.1628	-0.0029	0.1863	-0.0489
153	0.1141	-0.0046	0.1862	0.0664	219	0.1635	-0.0032	0.1666	-0.0534
154	0.1148	-0.0043	0.1741	0.0722	220	0.1641	-0.0034	0.1475	-0.0556
155	0.1155	-0.0041	0.1552	0.0744	221	0.1647	-0.0036	0.1429	-0.0589
156	0.1161	-0.0037	0.1468	0.0801	222	0.1653	-0.0038	0.1329	-0.0523
157	0.1167	-0.0034	0.1355	0.0731	223	0.1658	-0.0040	0.1366	-0.0407
158	0.1172	-0.0032	0.1338	0.0662	224	0.1664	-0.0042	0.1519	-0.0443
159	0.1177	-0.0029	0.1543	0.0554	225	0.1670	-0.0044	0.1526	-0.0440
160	0.1184	-0.0027	0.1549	0.0587	226	0.1676	-0.0045	0.1600	-0.0392
161	0.1190	-0.0024	0.1519	0.0633	227	0.1683	-0.0047	0.1700	-0.0391
162	0.1196	-0.0022	0.1775	0.0447	228	0.1690	-0.0048	0.1746	-0.0417
163	0.1204	-0.0021	0.1953	0.0496	229	0.1697	-0.0050	0.1868	-0.0377
164	0.1212	-0.0018	0.1921	0.0531	230	0.1705	-0.0051	0.2048	-0.0282
165	0.1219	-0.0016	0.2025	0.0407	231	0.1713	-0.0052	0.2213	-0.0313
166	0.1228	-0.0015	0.2313	0.0321	232	0.1722	-0.0054	0.2265	-0.0254
167	0.1238	-0.0014	0.2373	0.0247	233	0.1731	-0.0055	0.2347	-0.0105
168	0.1247	-0.0013	0.2265	0.0083	234	0.1741	-0.0055	0.2433	-0.0083
169	0.1256	-0.0013	0.2375	-0.0091	235	0.1751	-0.0055	0.2312	0.0004
170	0.1266	-0.0014	0.2363	-0.0168	236	0.1760	-0.0055	0.2290	0.0127
171	0.1275	-0.0014	0.2259	-0.0267	237	0.1769	-0.0054	0.2311	0.0163
172	0.1284	-0.0016	0.2142	-0.0461	238	0.1778	-0.0053	0.2100	0.0248
173	0.1292	-0.0018	0.2051	-0.0551	239	0.1786	-0.0052	0.1925	0.0313
174	0.1300	-0.0020	0.1913	-0.0649	240	0.1793	-0.0051	0.1917	0.0419
175	0.1307	-0.0023	0.1654	-0.0741	241	0.1801	-0.0049	0.1727	0.0476
176	0.1314	-0.0026	0.1517	-0.0729	242	0.1807	-0.0047	0.1546	0.0499
177	0.1320	-0.0029	0.1503	-0.0773	243	0.1813	-0.0045	0.1552	0.0508
178	0.1326	-0.0032	0.1429	-0.0730	244	0.1820	-0.0043	0.1459	0.0418
179	0.1331	-0.0035	0.1381	-0.0600	245	0.1825	-0.0041	0.1329	0.0379
180	0.1337	-0.0037	0.1438	-0.0549	246	0.1830	-0.0040	0.1353	0.0391
181	0.1342	-0.0039	0.1603	-0.0551	247	0.1836	-0.0038	0.1560	0.0372
182	0.1349	-0.0042	0.1743	-0.0507	248	0.1843	-0.0037	0.1700	0.0341
183	0.1356	-0.0043	0.1743	-0.0523	249	0.1850	-0.0036	0.1739	0.0276
184	0.1363	-0.0046	0.1824	-0.0541	250	0.1857	-0.0035	0.1827	0.0278
185	0.1371	-0.0048	0.1911	-0.0479	251	0.1864	-0.0033	0.1935	0.0302
186	0.1379	-0.0050	0.2011	-0.0430	252	0.1872	-0.0032	0.2014	0.0190
187	0.1387	-0.0051	0.2140	-0.0410	253	0.1880	-0.0032	0.2171	0.0209
188	0.1396	-0.0053	0.2138	-0.0364	254	0.1890	-0.0031	0.2332	0.0186
189	0.1404	-0.0054	0.2240	-0.0235	255	0.1899	-0.0030	0.2314	0.0054
190	0.1414	-0.0055	0.2351	-0.0084	256	0.1908	-0.0030	0.2321	-0.0007
191	0.1423	-0.0055	0.2266	0.0027	257	0.1918	-0.0030	0.2374	-0.0075
192	0.1432	-0.0054	0.2264	0.0100	258	0.1927	-0.0031	0.2310	-0.0101
193	0.1441	-0.0054	0.2223	0.0179	259	0.1936	-0.0031	0.2207	-0.0154
194	0.1450	-0.0053	0.2113	0.0328	260	0.1945	-0.0032	0.2101	-0.0214

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
261	0.1953	-0.0033	0.1942	-0.0340	288	0.2153	-0.0046	0.1321	0.0289
262	0.1960	-0.0035	0.1719	-0.0407	289	0.2158	-0.0044	0.1272	0.0220
263	0.1967	-0.0036	0.1507	-0.0375	290	0.2163	-0.0044	0.1442	0.0076
264	0.1972	-0.0038	0.1454	-0.0325	291	0.2169	-0.0044	0.1715	0.0259
265	0.1978	-0.0039	0.1420	-0.0387	292	0.2177	-0.0042	0.1776	0.0383
266	0.1984	-0.0041	0.1303	-0.0370	293	0.2183	-0.0040	0.1694	0.0196
267	0.1989	-0.0042	0.1379	-0.0243	294	0.2190	-0.0040	0.1820	0.0060
268	0.1995	-0.0043	0.1546	-0.0312	295	0.2198	-0.0040	0.1937	0.0006
269	0.2001	-0.0044	0.1651	-0.0318	296	0.2206	-0.0040	0.1992	0.0035
270	0.2008	-0.0045	0.1760	-0.0226	297	0.2214	-0.0040	0.2294	0.0077
271	0.2015	-0.0046	0.1868	-0.0264	298	0.2224	-0.0039	0.2344	-0.0032
272	0.2023	-0.0047	0.1898	-0.0281	299	0.2233	-0.0040	0.2255	-0.0077
273	0.2030	-0.0048	0.1940	-0.0175	300	0.2242	-0.0040	0.2411	-0.0010
274	0.2038	-0.0049	0.2112	-0.0159	301	0.2252	-0.0040	0.2374	-0.0039
275	0.2047	-0.0050	0.2167	-0.0214	302	0.2261	-0.0040	0.2280	-0.0133
276	0.2056	-0.0051	0.2272	-0.0151	303	0.2270	-0.0041	0.2224	-0.0081
277	0.2065	-0.0051	0.2369	-0.0089	304	0.2279	-0.0041	0.2050	-0.0039
278	0.2075	-0.0051	0.2272	-0.0048	305	0.2287	-0.0041	0.1897	-0.0068
279	0.2083	-0.0051	0.2306	0.0047	306	0.2294	-0.0042	0.1696	-0.0065
280	0.2093	-0.0051	0.2344	0.0073	307	0.2300	-0.0042	0.1519	-0.0110
281	0.2102	-0.0051	0.2135	0.0075	308	0.2306	-0.0042	0.1499	-0.0259
282	0.2110	-0.0050	0.2123	0.0132	309	0.2312	-0.0044	0.1483	-0.0240
283	0.2119	-0.0050	0.2101	0.0123	310	0.2318	-0.0044	0.1365	-0.0102
284	0.2127	-0.0049	0.1858	0.0148	311	0.2323	-0.0045	0.1361	-0.0103
285	0.2134	-0.0048	0.1698	0.0240	312	0.2329	-0.0045	0.1538	-0.0049
286	0.2141	-0.0047	0.1623	0.0243	313	0.2335	-0.0045	0.1687	-0.0022
287	0.2147	-0.0046	0.1517	0.0229	314	0.2342	-0.0045	-	-

Table B3.9 Raw data of free-rising EPS-5.078-SW in SW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0725	-0.0009	0.2286	-0.1381
2	0.0013	0.0002	0.3089	0.0419	66	0.0735	-0.0014	0.2222	-0.1420
3	0.0025	0.0003	0.3059	0.0299	67	0.0743	-0.0020	0.2114	-0.1387
4	0.0037	0.0004	0.3180	0.0074	68	0.0751	-0.0025	0.2170	-0.1307
5	0.0050	0.0004	0.3265	0.0014	69	0.0760	-0.0030	0.2090	-0.1311
6	0.0063	0.0004	0.3295	-0.0075	70	0.0768	-0.0036	0.2114	-0.1392
7	0.0077	0.0003	0.3204	-0.0258	71	0.0777	-0.0042	0.2219	-0.1246
8	0.0089	0.0002	0.3079	-0.0445	72	0.0786	-0.0046	0.2264	-0.1127
9	0.0101	0.0000	0.3095	-0.0628	73	0.0795	-0.0051	0.2420	-0.1161
10	0.0114	-0.0003	0.3193	-0.0745	74	0.0805	-0.0055	0.2645	-0.1044
11	0.0127	-0.0006	0.3075	-0.0894	75	0.0816	-0.0059	0.2736	-0.0954
12	0.0138	-0.0010	0.2786	-0.0953	76	0.0827	-0.0063	0.2763	-0.0892
13	0.0149	-0.0014	0.2713	-0.1064	77	0.0838	-0.0066	0.2790	-0.0746
14	0.0160	-0.0019	0.2733	-0.1145	78	0.0850	-0.0069	0.2916	-0.0623
15	0.0171	-0.0023	0.2646	-0.1217	79	0.0862	-0.0071	0.2938	-0.0549
16	0.0181	-0.0028	0.2377	-0.1205	80	0.0873	-0.0073	0.3136	-0.0476
17	0.0190	-0.0033	0.2474	-0.1217	81	0.0887	-0.0075	0.3263	-0.0329
18	0.0201	-0.0038	0.2617	-0.1288	82	0.0899	-0.0076	0.3037	-0.0136
19	0.0211	-0.0043	0.2652	-0.1228	83	0.0911	-0.0076	0.3171	0.0003
20	0.0222	-0.0048	0.2765	-0.1185	84	0.0925	-0.0076	0.3220	0.0187
21	0.0233	-0.0052	0.2760	-0.1097	85	0.0937	-0.0074	0.2994	0.0341
22	0.0244	-0.0057	0.2889	-0.1148	86	0.0948	-0.0073	0.3141	0.0457
23	0.0256	-0.0062	0.2927	-0.1068	87	0.0962	-0.0071	0.3096	0.0609
24	0.0268	-0.0065	0.2872	-0.0872	88	0.0973	-0.0068	0.2896	0.0735
25	0.0279	-0.0069	0.2961	-0.0843	89	0.0985	-0.0065	0.2866	0.0857
26	0.0291	-0.0072	0.3154	-0.0764	90	0.0996	-0.0061	0.2764	0.0973
27	0.0304	-0.0075	0.3107	-0.0600	91	0.1007	-0.0057	0.2655	0.1077
28	0.0316	-0.0077	0.3137	-0.0532	92	0.1017	-0.0052	0.2623	0.1190
29	0.0329	-0.0079	0.3206	-0.0347	93	0.1028	-0.0048	0.2606	0.1171
30	0.0342	-0.0080	0.3181	-0.0110	94	0.1038	-0.0043	0.2478	0.1181
31	0.0355	-0.0080	0.3194	-0.0027	95	0.1048	-0.0038	0.2386	0.1299
32	0.0367	-0.0080	0.3101	0.0060	96	0.1057	-0.0033	0.2487	0.1283
33	0.0380	-0.0079	0.3112	0.0326	97	0.1068	-0.0028	0.2617	0.1191
34	0.0392	-0.0077	0.3018	0.0522	98	0.1078	-0.0023	0.2534	0.1212
35	0.0404	-0.0075	0.2947	0.0668	99	0.1088	-0.0018	0.2559	0.1263
36	0.0416	-0.0072	0.2789	0.0922	100	0.1099	-0.0013	0.2726	0.1178
37	0.0426	-0.0068	0.2660	0.1105	101	0.1110	-0.0009	0.2735	0.1037
38	0.0437	-0.0063	0.2649	0.1184	102	0.1121	-0.0005	0.2757	0.1053
39	0.0447	-0.0058	0.2471	0.1314	103	0.1132	0.0000	0.2930	0.0988
40	0.0457	-0.0052	0.2300	0.1434	104	0.1144	0.0003	0.2985	0.0860
41	0.0466	-0.0047	0.2152	0.1377	105	0.1156	0.0007	0.3011	0.0759
42	0.0474	-0.0041	0.2228	0.1374	106	0.1168	0.0009	0.3025	0.0614
43	0.0483	-0.0036	0.2299	0.1414	107	0.1180	0.0011	0.3045	0.0507
44	0.0492	-0.0030	0.2224	0.1391	108	0.1193	0.0013	0.3097	0.0328
45	0.0501	-0.0025	0.2174	0.1449	109	0.1205	0.0014	0.3077	0.0146
46	0.0510	-0.0019	0.2268	0.1453	110	0.1217	0.0014	0.3170	0.0025
47	0.0519	-0.0013	0.2285	0.1330	111	0.1230	0.0014	0.3211	-0.0116
48	0.0528	-0.0008	0.2421	0.1290	112	0.1243	0.0013	0.3077	-0.0293
49	0.0539	-0.0003	0.2526	0.1249	113	0.1255	0.0012	0.3031	-0.0426
50	0.0548	0.0002	0.2670	0.1093	114	0.1267	0.0010	0.2886	-0.0579
51	0.0560	0.0006	0.2846	0.0959	115	0.1278	0.0007	0.2660	-0.0716
52	0.0571	0.0010	0.2781	0.0893	116	0.1288	0.0004	0.2704	-0.0810
53	0.0582	0.0013	0.2980	0.0750	117	0.1300	0.0001	0.2702	-0.0977
54	0.0595	0.0016	0.3278	0.0539	118	0.1310	-0.0003	0.2546	-0.1033
55	0.0609	0.0017	0.3276	0.0320	119	0.1320	-0.0007	0.2441	-0.1060
56	0.0621	0.0018	0.3125	0.0062	120	0.1329	-0.0012	0.2560	-0.1181
57	0.0634	0.0018	0.3136	-0.0180	121	0.1340	-0.0017	0.2611	-0.1191
58	0.0646	0.0017	0.3233	-0.0311	122	0.1350	-0.0021	0.2342	-0.1163
59	0.0659	0.0015	0.3157	-0.0415	123	0.1359	-0.0026	0.2280	-0.1183
60	0.0672	0.0014	0.3087	-0.0649	124	0.1369	-0.0031	0.2471	-0.1195
61	0.0684	0.0010	0.2972	-0.0894	125	0.1379	-0.0036	0.2713	-0.1236
62	0.0695	0.0006	0.2699	-0.1011	126	0.1390	-0.0041	0.2860	-0.1201
63	0.0706	0.0002	0.2622	-0.1183	127	0.1402	-0.0045	0.2636	-0.1158
64	0.0716	-0.0003	0.2393	-0.1344	128	0.1411	-0.0050	0.2668	-0.1038

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.1423	-0.0054	0.2987	-0.1031	179	0.1972	-0.0029	0.2785	-0.0903
130	0.1435	-0.0058	0.2840	-0.0985	180	0.1983	-0.0033	0.2763	-0.0998
131	0.1446	-0.0062	0.2773	-0.0745	181	0.1994	-0.0037	0.2869	-0.0916
132	0.1457	-0.0064	0.3046	-0.0653	182	0.2006	-0.0040	0.3084	-0.0878
133	0.1470	-0.0067	0.3107	-0.0563	183	0.2018	-0.0044	0.3041	-0.0804
134	0.1482	-0.0069	0.2917	-0.0357	184	0.2030	-0.0046	0.3139	-0.0592
135	0.1494	-0.0070	0.3056	-0.0170	185	0.2043	-0.0048	0.3188	-0.0554
136	0.1507	-0.0070	0.3152	-0.0058	186	0.2056	-0.0051	0.3144	-0.0414
137	0.1519	-0.0070	0.2962	0.0172	187	0.2069	-0.0052	0.3238	-0.0165
138	0.1530	-0.0069	0.2730	0.0383	188	0.2082	-0.0052	0.3239	-0.0009
139	0.1541	-0.0067	0.2499	0.0595	189	0.2095	-0.0052	0.3236	0.0143
140	0.1550	-0.0064	0.2479	0.0728	190	0.2107	-0.0051	0.3186	0.0148
141	0.1560	-0.0061	0.2302	0.0858	191	0.2120	-0.0051	0.3061	0.0286
142	0.1569	-0.0057	0.2193	0.1003	192	0.2132	-0.0049	0.2931	0.0520
143	0.1578	-0.0053	0.2310	0.0932	193	0.2143	-0.0046	0.2826	0.0634
144	0.1587	-0.0050	0.2300	0.1016	194	0.2155	-0.0044	0.2762	0.0698
145	0.1596	-0.0045	0.2204	0.1045	195	0.2166	-0.0041	0.2703	0.0736
146	0.1605	-0.0041	0.2105	0.1084	196	0.2176	-0.0038	0.2580	0.0830
147	0.1613	-0.0036	0.2285	0.1210	197	0.2186	-0.0034	0.2514	0.0835
148	0.1623	-0.0032	0.2372	0.1162	198	0.2196	-0.0031	0.2501	0.0922
149	0.1632	-0.0027	0.2398	0.1098	199	0.2206	-0.0027	0.2444	0.0993
150	0.1642	-0.0023	0.2470	0.0976	200	0.2216	-0.0023	0.2479	0.0875
151	0.1652	-0.0019	0.2500	0.0967	201	0.2226	-0.0020	0.2566	0.0857
152	0.1662	-0.0015	0.2619	0.1128	202	0.2236	-0.0016	0.2573	0.0894
153	0.1673	-0.0010	0.2737	0.1052	203	0.2247	-0.0013	0.2602	0.0878
154	0.1684	-0.0007	0.2842	0.0880	204	0.2257	-0.0009	0.2669	0.0848
155	0.1696	-0.0003	0.2840	0.0866	205	0.2268	-0.0006	0.2703	0.0786
156	0.1707	0.0000	0.2928	0.0800	206	0.2279	-0.0003	0.2811	0.0847
157	0.1719	0.0003	0.3097	0.0719	207	0.2290	0.0001	0.3047	0.0747
158	0.1732	0.0006	0.3085	0.0547	208	0.2303	0.0003	0.3099	0.0631
159	0.1744	0.0008	0.3034	0.0463	209	0.2315	0.0006	0.3075	0.0643
160	0.1756	0.0010	0.3158	0.0423	210	0.2328	0.0008	0.3267	0.0467
161	0.1769	0.0011	0.3246	0.0293	211	0.2341	0.0010	0.3329	0.0344
162	0.1782	0.0012	0.3187	0.0193	212	0.2354	0.0011	0.3342	0.0197
163	0.1795	0.0013	0.3032	0.0084	213	0.2368	0.0011	0.3306	-0.0022
164	0.1806	0.0013	0.3124	-0.0008	214	0.2381	0.0011	0.3179	-0.0103
165	0.1820	0.0012	0.3026	-0.0174	215	0.2394	0.0010	0.3147	-0.0187
166	0.1831	0.0011	0.2912	-0.0349	216	0.2406	0.0009	0.2997	-0.0361
167	0.1843	0.0010	0.2912	-0.0493	217	0.2418	0.0008	0.2881	-0.0414
168	0.1854	0.0007	0.2712	-0.0574	218	0.2429	0.0006	0.2703	-0.0451
169	0.1865	0.0005	0.2842	-0.0641	219	0.2439	0.0004	0.2514	-0.0635
170	0.1877	0.0002	0.2783	-0.0700	220	0.2449	0.0001	0.2452	-0.0786
171	0.1887	-0.0001	0.2659	-0.0754	221	0.2459	-0.0002	0.2271	-0.0812
172	0.1898	-0.0004	0.2656	-0.0833	222	0.2467	-0.0006	0.2282	-0.0817
173	0.1908	-0.0007	0.2537	-0.0838	223	0.2477	-0.0009	0.2304	-0.0969
174	0.1918	-0.0011	0.2584	-0.0895	224	0.2486	-0.0013	0.2034	-0.0955
175	0.1929	-0.0014	0.2621	-0.0950	225	0.2493	-0.0017	0.2075	-0.0953
176	0.1939	-0.0018	0.2627	-0.0884	226	0.2502	-0.0021	0.2248	-0.0948
177	0.1950	-0.0021	0.2679	-0.0898	227	0.2511	-0.0024	0.2335	-0.0891
178	0.1961	-0.0025	0.2729	-0.0898	228	0.2521	-0.0028	-	-

Table B3.10 Raw data of free-rising EPS-5.240-SW in SW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0737	-0.0049	0.3286	0.0342
2	0.0011	-0.0005	0.2631	-0.1049	66	0.0750	-0.0047	0.3237	0.0567
3	0.0021	-0.0008	0.2714	-0.0996	67	0.0763	-0.0045	0.3185	0.0525
4	0.0032	-0.0013	0.2686	-0.1084	68	0.0776	-0.0043	0.3248	0.0612
5	0.0043	-0.0017	0.2822	-0.1113	69	0.0789	-0.0040	0.3162	0.0794
6	0.0055	-0.0022	0.2929	-0.1003	70	0.0801	-0.0037	0.3157	0.0828
7	0.0066	-0.0025	0.2899	-0.0850	71	0.0814	-0.0033	0.3095	0.0862
8	0.0078	-0.0028	0.3066	-0.0786	72	0.0826	-0.0030	0.2997	0.0954
9	0.0090	-0.0031	0.3184	-0.0841	73	0.0838	-0.0026	0.2980	0.0940
10	0.0104	-0.0035	0.3205	-0.0691	74	0.0850	-0.0022	0.3121	0.0828
11	0.0116	-0.0037	0.3250	-0.0593	75	0.0863	-0.0019	0.3164	0.0851
12	0.0130	-0.0040	0.3240	-0.0557	76	0.0875	-0.0015	0.3026	0.0886
13	0.0142	-0.0041	0.3162	-0.0337	77	0.0887	-0.0012	0.2926	0.0794
14	0.0155	-0.0042	0.3376	-0.0203	78	0.0898	-0.0009	0.3047	0.0616
15	0.0169	-0.0043	0.3458	-0.0012	79	0.0912	-0.0007	0.3401	0.0543
16	0.0183	-0.0043	0.3376	0.0214	80	0.0926	-0.0005	0.3233	0.0522
17	0.0196	-0.0041	0.3337	0.0399	81	0.0937	-0.0003	0.3233	0.0421
18	0.0209	-0.0039	0.3296	0.0556	82	0.0952	-0.0001	0.3377	0.0308
19	0.0222	-0.0037	0.3171	0.0786	83	0.0964	0.0000	0.3320	0.0180
20	0.0235	-0.0033	0.2932	0.0998	84	0.0978	0.0000	0.3427	0.0035
21	0.0246	-0.0029	0.2897	0.1077	85	0.0992	0.0000	0.3480	-0.0087
22	0.0258	-0.0024	0.2764	0.1076	86	0.1006	-0.0001	0.3537	-0.0167
23	0.0268	-0.0020	0.2508	0.1147	87	0.1020	-0.0001	0.3508	-0.0388
24	0.0278	-0.0015	0.2607	0.1213	88	0.1034	-0.0004	0.3375	-0.0662
25	0.0289	-0.0011	0.2512	0.1295	89	0.1047	-0.0007	0.3212	-0.0744
26	0.0298	-0.0005	0.2045	0.1384	90	0.1060	-0.0010	0.3278	-0.0951
27	0.0305	0.0001	0.2125	0.1417	91	0.1073	-0.0014	0.3209	-0.1125
28	0.0315	0.0006	0.2574	0.1267	92	0.1085	-0.0019	0.2879	-0.1178
29	0.0326	0.0011	0.2503	0.0960	93	0.1096	-0.0024	0.2921	-0.1316
30	0.0335	0.0014	0.2301	0.1013	94	0.1109	-0.0029	0.2809	-0.1336
31	0.0344	0.0019	0.2503	0.1010	95	0.1119	-0.0034	0.2641	-0.1403
32	0.0355	0.0022	0.2799	0.0839	96	0.1130	-0.0040	0.2689	-0.1559
33	0.0367	0.0025	0.3011	0.0722	97	0.1140	-0.0047	0.2538	-0.1462
34	0.0379	0.0028	0.3005	0.0687	98	0.1150	-0.0052	0.2446	-0.1337
35	0.0391	0.0031	0.3110	0.0558	99	0.1160	-0.0058	0.2482	-0.1398
36	0.0404	0.0032	0.3318	0.0318	100	0.1170	-0.0063	0.2461	-0.1345
37	0.0417	0.0034	0.3370	0.0188	101	0.1180	-0.0068	0.2403	-0.1271
38	0.0431	0.0034	0.3331	-0.0066	102	0.1189	-0.0074	0.2495	-0.1277
39	0.0444	0.0033	0.3227	-0.0368	103	0.1200	-0.0079	0.2517	-0.1184
40	0.0457	0.0031	0.3142	-0.0658	104	0.1209	-0.0083	0.2578	-0.1136
41	0.0469	0.0028	0.3012	-0.0840	105	0.1220	-0.0088	0.2718	-0.1092
42	0.0481	0.0024	0.2903	-0.0934	106	0.1231	-0.0092	0.2800	-0.0950
43	0.0492	0.0020	0.2691	-0.1025	107	0.1243	-0.0095	0.3013	-0.0903
44	0.0502	0.0016	0.2485	-0.1090	108	0.1255	-0.0099	0.3190	-0.0831
45	0.0512	0.0012	0.2527	-0.1261	109	0.1268	-0.0102	0.3153	-0.0693
46	0.0523	0.0006	0.2449	-0.1296	110	0.1280	-0.0105	0.3230	-0.0510
47	0.0532	0.0001	0.2382	-0.1219	111	0.1294	-0.0106	0.3477	-0.0277
48	0.0542	-0.0004	0.2400	-0.1259	112	0.1308	-0.0107	0.3599	-0.0049
49	0.0551	-0.0009	0.2318	-0.1317	113	0.1323	-0.0106	0.3474	0.0097
50	0.0560	-0.0014	0.2391	-0.1198	114	0.1336	-0.0106	0.3492	0.0162
51	0.0570	-0.0018	0.2433	-0.1110	115	0.1351	-0.0105	0.3385	0.0392
52	0.0580	-0.0023	0.2418	-0.1203	116	0.1363	-0.0103	0.3159	0.0693
53	0.0589	-0.0028	0.2550	-0.1118	117	0.1376	-0.0100	0.3093	0.0936
54	0.0600	-0.0032	0.2704	-0.0981	118	0.1388	-0.0095	0.2894	0.1037
55	0.0611	-0.0036	0.2654	-0.0855	119	0.1399	-0.0091	0.2773	0.1097
56	0.0621	-0.0039	0.2793	-0.0777	120	0.1410	-0.0087	0.2598	0.1203
57	0.0633	-0.0042	0.2912	-0.0743	121	0.1420	-0.0082	0.2341	0.1258
58	0.0645	-0.0045	0.3039	-0.0625	122	0.1429	-0.0076	0.2199	0.1296
59	0.0658	-0.0047	0.3207	-0.0462	123	0.1438	-0.0071	0.2063	0.1308
60	0.0670	-0.0049	0.3225	-0.0373	124	0.1445	-0.0066	0.2132	0.1291
61	0.0683	-0.0050	0.3331	-0.0243	125	0.1455	-0.0061	0.2236	0.1225
62	0.0697	-0.0051	0.3405	-0.0011	126	0.1463	-0.0056	0.2231	0.1243
63	0.0711	-0.0050	0.3403	0.0075	127	0.1472	-0.0051	0.2404	0.1139
64	0.0724	-0.0050	0.3283	0.0107	128	0.1482	-0.0047	0.2395	0.1097

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.1492	-0.0042	0.2371	0.1158	179	0.2075	-0.0068	0.2400	0.1439
130	0.1501	-0.0038	0.2559	0.1073	180	0.2084	-0.0063	0.2418	0.1449
131	0.1512	-0.0034	0.2700	0.0949	181	0.2094	-0.0057	0.2589	0.1501
132	0.1523	-0.0030	0.2778	0.0846	182	0.2105	-0.0051	0.2572	0.1402
133	0.1534	-0.0027	0.2922	0.0820	183	0.2115	-0.0046	0.2710	0.1325
134	0.1546	-0.0024	0.3161	0.0682	184	0.2127	-0.0040	0.2748	0.1278
135	0.1560	-0.0021	0.3178	0.0648	185	0.2137	-0.0035	0.2645	0.1125
136	0.1572	-0.0018	0.3030	0.0538	186	0.2148	-0.0031	0.3044	0.1144
137	0.1584	-0.0017	0.3182	0.0388	187	0.2161	-0.0026	0.2949	0.1019
138	0.1597	-0.0015	0.3301	0.0363	188	0.2171	-0.0023	0.2985	0.0915
139	0.1610	-0.0014	0.3239	0.0183	189	0.2185	-0.0019	0.3107	0.0761
140	0.1623	-0.0014	0.3413	-0.0022	190	0.2196	-0.0017	0.3106	0.0552
141	0.1638	-0.0014	0.3639	-0.0162	191	0.2210	-0.0014	0.3448	0.0602
142	0.1652	-0.0015	0.3391	-0.0428	192	0.2224	-0.0012	0.3264	0.0456
143	0.1665	-0.0018	0.3176	-0.0660	193	0.2236	-0.0011	0.3163	0.0192
144	0.1678	-0.0021	0.3118	-0.0734	194	0.2249	-0.0011	0.3222	0.0051
145	0.1690	-0.0024	0.3188	-0.1052	195	0.2262	-0.0010	0.3430	-0.0025
146	0.1703	-0.0029	0.3000	-0.1311	196	0.2277	-0.0011	0.3706	-0.0160
147	0.1714	-0.0034	0.2784	-0.1287	197	0.2292	-0.0012	0.3099	-0.0393
148	0.1725	-0.0039	0.2799	-0.1360	198	0.2301	-0.0014	0.2613	-0.0661
149	0.1736	-0.0045	0.2526	-0.1630	199	0.2313	-0.0017	0.2857	-0.0877
150	0.1746	-0.0052	0.2334	-0.1603	200	0.2324	-0.0021	0.2804	-0.1020
151	0.1755	-0.0058	0.2425	-0.1503	201	0.2335	-0.0025	0.2696	-0.0949
152	0.1765	-0.0064	0.2430	-0.1488	202	0.2346	-0.0028	0.2822	-0.0985
153	0.1774	-0.0070	0.2253	-0.1516	203	0.2358	-0.0033	0.2596	-0.1278
154	0.1783	-0.0076	0.2502	-0.1543	204	0.2367	-0.0039	0.2182	-0.1357
155	0.1794	-0.0082	0.2461	-0.1398	205	0.2375	-0.0044	0.2431	-0.1408
156	0.1803	-0.0088	0.2350	-0.1288	206	0.2386	-0.0050	0.2440	-0.1453
157	0.1813	-0.0092	0.2585	-0.1202	207	0.2395	-0.0055	0.2222	-0.1354
158	0.1823	-0.0097	0.2849	-0.1250	208	0.2404	-0.0061	0.2412	-0.1352
159	0.1836	-0.0102	0.3117	-0.1183	209	0.2414	-0.0066	0.2635	-0.1383
160	0.1848	-0.0107	0.2883	-0.0967	210	0.2425	-0.0072	0.2498	-0.1334
161	0.1859	-0.0110	0.2951	-0.0842	211	0.2434	-0.0077	0.2581	-0.1269
162	0.1872	-0.0113	0.3173	-0.0689	212	0.2446	-0.0082	0.2801	-0.1298
163	0.1884	-0.0116	0.3122	-0.0523	213	0.2456	-0.0087	0.2828	-0.1289
164	0.1897	-0.0118	0.3407	-0.0522	214	0.2468	-0.0092	0.2978	-0.1027
165	0.1911	-0.0120	0.3618	-0.0344	215	0.2480	-0.0096	0.3006	-0.0891
166	0.1926	-0.0120	0.3434	0.0009	216	0.2492	-0.0099	0.3009	-0.0789
167	0.1939	-0.0120	0.3225	0.0174	217	0.2504	-0.0102	0.3132	-0.0703
168	0.1952	-0.0119	0.3339	0.0302	218	0.2517	-0.0105	0.3156	-0.0546
169	0.1966	-0.0117	0.3110	0.0547	219	0.2529	-0.0106	0.2934	-0.0276
170	0.1977	-0.0115	0.2948	0.0749	220	0.2541	-0.0107	0.2968	-0.0232
171	0.1989	-0.0111	0.3075	0.0870	221	0.2553	-0.0108	0.3029	-0.0019
172	0.2001	-0.0108	0.3058	0.1054	222	0.2565	-0.0107	0.2857	0.0208
173	0.2014	-0.0103	0.2916	0.1234	223	0.2576	-0.0106	0.2717	0.0420
174	0.2025	-0.0098	0.2811	0.1310	224	0.2587	-0.0104	0.2506	0.0609
175	0.2036	-0.0092	0.2610	0.1474	225	0.2596	-0.0102	0.2421	0.0707
176	0.2045	-0.0086	0.2372	0.1564	226	0.2606	-0.0098	0.2475	0.0828
177	0.2055	-0.0080	0.2468	0.1461	227	0.2616	-0.0095	-	-
178	0.2065	-0.0074	0.2498	0.1449					

Table B3.11 Raw data of free-rising EPS-6.077-SW in SW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0736	-0.0067	0.2137	-0.1389
2	0.0012	-0.0003	0.3153	-0.0813	66	0.0745	-0.0073	0.2171	-0.1468
3	0.0025	-0.0007	0.2872	-0.0941	67	0.0754	-0.0079	0.2116	-0.1350
4	0.0035	-0.0010	0.2525	-0.1096	68	0.0762	-0.0084	0.2162	-0.1355
5	0.0045	-0.0015	0.2373	-0.1226	69	0.0771	-0.0090	0.2274	-0.1370
6	0.0054	-0.0020	0.2115	-0.1242	70	0.0780	-0.0095	0.2309	-0.1299
7	0.0062	-0.0025	0.2016	-0.1150	71	0.0789	-0.0100	0.2353	-0.1308
8	0.0071	-0.0029	0.2094	-0.1188	72	0.0799	-0.0105	0.2574	-0.1274
9	0.0079	-0.0035	0.2168	-0.1259	73	0.0810	-0.0110	0.2703	-0.1214
10	0.0088	-0.0039	0.2098	-0.1170	74	0.0821	-0.0115	0.2830	-0.1224
11	0.0096	-0.0044	0.2145	-0.1175	75	0.0833	-0.0120	0.2947	-0.1137
12	0.0105	-0.0049	0.2436	-0.1151	76	0.0844	-0.0124	0.3043	-0.1006
13	0.0115	-0.0053	0.2449	-0.1054	77	0.0857	-0.0128	0.3240	-0.0879
14	0.0125	-0.0057	0.2403	-0.1105	78	0.0870	-0.0131	0.3358	-0.0727
15	0.0135	-0.0062	0.2473	-0.1092	79	0.0884	-0.0134	0.3491	-0.0635
16	0.0144	-0.0066	0.2676	-0.0997	80	0.0898	-0.0136	0.3548	-0.0522
17	0.0156	-0.0070	0.2821	-0.1060	81	0.0912	-0.0138	0.3497	-0.0351
18	0.0167	-0.0074	0.2787	-0.0989	82	0.0926	-0.0139	0.3496	-0.0221
19	0.0178	-0.0078	0.2942	-0.0909	83	0.0940	-0.0140	0.3466	-0.0065
20	0.0191	-0.0082	0.3040	-0.0880	84	0.0954	-0.0139	0.3357	0.0156
21	0.0203	-0.0085	0.3005	-0.0802	85	0.0967	-0.0138	0.3259	0.0354
22	0.0215	-0.0088	0.3105	-0.0743	86	0.0980	-0.0137	0.3193	0.0565
23	0.0227	-0.0091	0.3112	-0.0631	87	0.0993	-0.0134	0.3086	0.0758
24	0.0239	-0.0093	0.3141	-0.0504	88	0.1005	-0.0131	0.2903	0.0926
25	0.0253	-0.0095	0.3292	-0.0451	89	0.1016	-0.0127	0.2628	0.0985
26	0.0266	-0.0097	0.3305	-0.0330	90	0.1026	-0.0123	0.2388	0.0928
27	0.0279	-0.0098	0.3305	-0.0225	91	0.1035	-0.0119	0.2350	0.1111
28	0.0292	-0.0099	0.3327	-0.0118	92	0.1045	-0.0114	0.2317	0.1220
29	0.0306	-0.0099	0.3232	0.0075	93	0.1053	-0.0109	0.2110	0.1149
30	0.0318	-0.0098	0.3153	0.0236	94	0.1061	-0.0105	0.2093	0.1166
31	0.0331	-0.0097	0.3158	0.0487	95	0.1070	-0.0100	0.2100	0.1152
32	0.0343	-0.0094	0.3146	0.0603	96	0.1078	-0.0095	0.2127	0.1108
33	0.0356	-0.0092	0.3067	0.0663	97	0.1087	-0.0091	0.2229	0.1115
34	0.0368	-0.0089	0.2952	0.0794	98	0.1096	-0.0086	0.2256	0.1171
35	0.0380	-0.0086	0.2848	0.0906	99	0.1105	-0.0082	0.2409	0.1138
36	0.0391	-0.0082	0.2707	0.1019	100	0.1115	-0.0077	0.2589	0.1122
37	0.0401	-0.0077	0.2640	0.1079	101	0.1126	-0.0073	0.2696	0.1075
38	0.0412	-0.0073	0.2686	0.1127	102	0.1137	-0.0069	0.2743	0.1011
39	0.0423	-0.0068	0.2787	0.1097	103	0.1148	-0.0065	0.2775	0.1005
40	0.0434	-0.0064	0.2677	0.1125	104	0.1159	-0.0061	0.2903	0.0938
41	0.0444	-0.0059	0.2653	0.1171	105	0.1171	-0.0057	0.3020	0.0827
42	0.0455	-0.0055	0.2819	0.1088	106	0.1183	-0.0054	0.3119	0.0791
43	0.0467	-0.0051	0.2865	0.1113	107	0.1196	-0.0051	0.3195	0.0801
44	0.0478	-0.0046	0.2945	0.1100	108	0.1209	-0.0048	0.3311	0.0745
45	0.0490	-0.0042	0.3008	0.1069	109	0.1223	-0.0045	0.3464	0.0691
46	0.0502	-0.0037	0.3103	0.1049	110	0.1237	-0.0042	0.3388	0.0679
47	0.0515	-0.0033	0.3253	0.0872	111	0.1250	-0.0039	0.3468	0.0510
48	0.0528	-0.0030	0.3355	0.0809	112	0.1264	-0.0038	0.3545	0.0407
49	0.0542	-0.0027	0.3417	0.0763	113	0.1278	-0.0036	0.3515	0.0374
50	0.0556	-0.0024	0.3437	0.0629	114	0.1292	-0.0035	0.3577	0.0357
51	0.0569	-0.0022	0.3577	0.0537	115	0.1307	-0.0033	0.3643	0.0279
52	0.0584	-0.0020	0.3605	0.0326	116	0.1322	-0.0033	0.3721	0.0070
53	0.0598	-0.0019	0.3497	0.0045	117	0.1336	-0.0033	0.3608	-0.0089
54	0.0612	-0.0020	0.3515	-0.0161	118	0.1350	-0.0034	0.3536	-0.0115
55	0.0626	-0.0021	0.3546	-0.0395	119	0.1365	-0.0034	0.3700	-0.0167
56	0.0641	-0.0023	0.3413	-0.0634	120	0.1380	-0.0035	0.3522	-0.0314
57	0.0654	-0.0026	0.3382	-0.0904	121	0.1393	-0.0036	0.3284	-0.0473
58	0.0668	-0.0030	0.3150	-0.1076	122	0.1406	-0.0039	0.3191	-0.0570
59	0.0679	-0.0034	0.2796	-0.1173	123	0.1418	-0.0041	0.2956	-0.0636
60	0.0690	-0.0039	0.2755	-0.1364	124	0.1430	-0.0044	0.2819	-0.0782
61	0.0701	-0.0045	0.2532	-0.1448	125	0.1441	-0.0047	0.2696	-0.0885
62	0.0710	-0.0051	0.2366	-0.1378	126	0.1451	-0.0051	0.2536	-0.0905
63	0.0720	-0.0056	0.2236	-0.1357	127	0.1461	-0.0054	0.2438	-0.0919
64	0.0728	-0.0062	0.2044	-0.1332	128	0.1471	-0.0058	0.2346	-0.0992

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.1480	-0.0062	0.2301	-0.0980	175	0.2012	-0.0040	0.3182	-0.0474
130	0.1489	-0.0066	0.2271	-0.0909	176	0.2025	-0.0042	0.3106	-0.0563
131	0.1498	-0.0070	0.2396	-0.0852	177	0.2037	-0.0045	0.2886	-0.0623
132	0.1509	-0.0073	0.2560	-0.0842	178	0.2048	-0.0047	0.2727	-0.0715
133	0.1519	-0.0076	0.2543	-0.0856	179	0.2058	-0.0050	0.2606	-0.0804
134	0.1529	-0.0080	0.2635	-0.0877	180	0.2068	-0.0054	0.2557	-0.0856
135	0.1540	-0.0083	0.2676	-0.0825	181	0.2079	-0.0057	0.2480	-0.0924
136	0.1550	-0.0086	0.2768	-0.0855	182	0.2088	-0.0061	0.2373	-0.0902
137	0.1562	-0.0090	0.2859	-0.0802	183	0.2098	-0.0065	0.2377	-0.0847
138	0.1573	-0.0093	0.2970	-0.0750	184	0.2107	-0.0068	0.2462	-0.0877
139	0.1586	-0.0096	0.3088	-0.0703	185	0.2118	-0.0072	0.2551	-0.0863
140	0.1598	-0.0098	0.3206	-0.0502	186	0.2128	-0.0075	0.2560	-0.0859
141	0.1611	-0.0100	0.3342	-0.0441	187	0.2138	-0.0078	0.2587	-0.0890
142	0.1625	-0.0102	0.3475	-0.0374	188	0.2148	-0.0082	0.2752	-0.0859
143	0.1639	-0.0103	0.3562	-0.0178	189	0.2160	-0.0085	0.2880	-0.0720
144	0.1653	-0.0103	0.3456	0.0033	190	0.2171	-0.0088	0.3004	-0.0788
145	0.1667	-0.0103	0.3336	0.0217	191	0.2184	-0.0092	0.3175	-0.0742
146	0.1680	-0.0102	0.3286	0.0397	192	0.2197	-0.0094	0.3192	-0.0558
147	0.1693	-0.0100	0.3201	0.0503	193	0.2210	-0.0096	0.3250	-0.0613
148	0.1705	-0.0098	0.2933	0.0606	194	0.2223	-0.0099	0.3253	-0.0628
149	0.1716	-0.0095	0.2738	0.0723	195	0.2236	-0.0101	0.3435	-0.0576
150	0.1727	-0.0092	0.2556	0.0788	196	0.2250	-0.0103	0.3560	-0.0529
151	0.1737	-0.0089	0.2333	0.0808	197	0.2264	-0.0105	0.3495	-0.0468
152	0.1746	-0.0085	0.2137	0.0843	198	0.2278	-0.0107	0.3450	-0.0393
153	0.1754	-0.0082	0.2139	0.0865	199	0.2292	-0.0108	0.3487	-0.0412
154	0.1763	-0.0078	0.2182	0.0806	200	0.2306	-0.0110	0.3499	-0.0398
155	0.1771	-0.0075	0.2158	0.0768	201	0.2320	-0.0112	0.3460	-0.0354
156	0.1780	-0.0072	0.2152	0.0813	202	0.2334	-0.0113	0.3496	-0.0218
157	0.1789	-0.0069	0.2190	0.0835	203	0.2348	-0.0113	0.3429	-0.0077
158	0.1798	-0.0066	0.2397	0.0805	204	0.2361	-0.0114	0.3331	-0.0048
159	0.1808	-0.0062	0.2421	0.0842	205	0.2374	-0.0114	0.3227	0.0025
160	0.1817	-0.0059	0.2567	0.0795	206	0.2387	-0.0113	0.3223	0.0093
161	0.1828	-0.0056	0.2785	0.0801	207	0.2400	-0.0113	0.3190	0.0068
162	0.1840	-0.0052	0.2849	0.0846	208	0.2413	-0.0113	0.2913	0.0166
163	0.1851	-0.0049	0.2963	0.0756	209	0.2423	-0.0112	0.2854	0.0233
164	0.1863	-0.0046	0.3108	0.0634	210	0.2435	-0.0111	0.3021	0.0253
165	0.1876	-0.0044	0.3311	0.0563	211	0.2448	-0.0110	0.2966	0.0327
166	0.1890	-0.0042	0.3284	0.0566	212	0.2459	-0.0108	0.2827	0.0337
167	0.1902	-0.0040	0.3299	0.0417	213	0.2470	-0.0107	0.2729	0.0384
168	0.1916	-0.0038	0.3513	0.0318	214	0.2481	-0.0105	0.2751	0.0480
169	0.1930	-0.0037	0.3540	0.0239	215	0.2492	-0.0103	0.2898	0.0607
170	0.1944	-0.0037	0.3481	0.0076	216	0.2504	-0.0101	0.2853	0.0525
171	0.1958	-0.0037	0.3430	-0.0049	217	0.2515	-0.0099	0.2802	0.0553
172	0.1972	-0.0037	0.3412	-0.0155	218	0.2527	-0.0096	0.2954	0.0677
173	0.1986	-0.0038	0.3397	-0.0206	219	0.2539	-0.0093	-	-
174	0.1999	-0.0039	0.3271	-0.0308					

Table B3.12 Raw data of free-rising PMMA-2.812-SW in SW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0116	-0.0001	0.0463	0.0000
2	0.0001	0.0000	0.0367	0.0035	66	0.0118	-0.0001	0.0449	-0.0014
3	0.0003	0.0000	0.0450	-0.0001	67	0.0120	-0.0001	0.0436	-0.0014
4	0.0005	0.0000	0.0445	-0.0015	68	0.0122	-0.0001	0.0438	0.0008
5	0.0006	0.0000	0.0397	-0.0009	69	0.0123	-0.0001	0.0421	0.0003
6	0.0008	0.0000	0.0419	0.0000	70	0.0125	-0.0001	0.0423	0.0002
7	0.0010	0.0000	0.0471	-0.0006	71	0.0127	-0.0001	0.0441	-0.0001
8	0.0012	0.0000	0.0534	-0.0004	72	0.0129	-0.0001	0.0452	0.0004
9	0.0014	0.0000	0.0473	-0.0004	73	0.0130	-0.0001	0.0415	-0.0004
10	0.0016	0.0000	0.0489	-0.0006	74	0.0132	-0.0001	0.0416	-0.0018
11	0.0018	0.0000	0.0518	0.0008	75	0.0134	-0.0001	0.0445	-0.0012
12	0.0020	0.0000	0.0437	-0.0003	76	0.0135	-0.0001	0.0446	0.0001
13	0.0022	0.0000	0.0413	-0.0030	77	0.0137	-0.0001	0.0497	0.0015
14	0.0023	0.0000	0.0462	-0.0008	78	0.0139	-0.0001	0.0480	-0.0020
15	0.0025	0.0000	0.0444	0.0003	79	0.0141	-0.0001	0.0479	-0.0012
16	0.0027	0.0000	0.0421	-0.0001	80	0.0143	-0.0001	0.0476	0.0034
17	0.0029	0.0000	0.0419	0.0000	81	0.0145	-0.0001	0.0475	0.0009
18	0.0030	0.0000	0.0437	0.0006	82	0.0147	-0.0001	0.0447	-0.0025
19	0.0032	0.0000	0.0436	0.0014	83	0.0149	-0.0001	0.0452	0.0009
20	0.0034	0.0000	0.0396	0.0012	84	0.0151	-0.0001	0.0453	0.0020
21	0.0035	0.0000	0.0409	-0.0001	85	0.0152	-0.0001	0.0439	-0.0004
22	0.0037	0.0000	0.0469	-0.0009	86	0.0154	-0.0001	0.0440	-0.0016
23	0.0039	0.0000	0.0523	0.0011	87	0.0156	-0.0001	0.0436	0.0000
24	0.0041	0.0000	0.0471	-0.0006	88	0.0158	-0.0001	0.0519	0.0013
25	0.0043	0.0000	0.0487	-0.0018	89	0.0160	-0.0001	0.0497	-0.0012
26	0.0045	0.0000	0.0512	-0.0007	90	0.0162	-0.0001	0.0469	-0.0003
27	0.0047	0.0000	0.0473	-0.0010	91	0.0164	-0.0001	0.0464	0.0016
28	0.0049	0.0000	0.0426	-0.0023	92	0.0165	-0.0001	0.0445	0.0016
29	0.0050	0.0000	0.0456	-0.0026	93	0.0167	-0.0001	0.0454	-0.0008
30	0.0052	0.0000	0.0469	-0.0007	94	0.0169	-0.0001	0.0475	-0.0007
31	0.0054	0.0000	0.0450	-0.0031	95	0.0171	-0.0001	0.0425	0.0004
32	0.0056	-0.0001	0.0517	-0.0039	96	0.0172	-0.0001	0.0426	-0.0006
33	0.0058	-0.0001	0.0498	-0.0013	97	0.0174	-0.0001	0.0466	-0.0016
34	0.0060	-0.0001	0.0458	0.0002	98	0.0176	-0.0001	0.0440	-0.0001
35	0.0062	-0.0001	0.0426	-0.0008	99	0.0178	-0.0001	0.0419	0.0023
36	0.0063	-0.0001	0.0462	-0.0017	100	0.0179	-0.0001	0.0417	0.0002
37	0.0066	-0.0001	0.0473	0.0012	101	0.0181	-0.0001	0.0420	-0.0012
38	0.0067	-0.0001	0.0445	0.0039	102	0.0183	-0.0001	0.0411	0.0010
39	0.0069	0.0000	0.0430	0.0010	103	0.0185	-0.0001	0.0405	-0.0006
40	0.0071	-0.0001	0.0444	-0.0011	104	0.0186	-0.0001	0.0445	-0.0019
41	0.0073	-0.0001	0.0471	0.0001	105	0.0188	-0.0001	0.0460	-0.0007
42	0.0074	-0.0001	0.0443	0.0018	106	0.0190	-0.0001	0.0429	0.0005
43	0.0076	0.0000	0.0414	0.0004	107	0.0192	-0.0001	0.0501	0.0003
44	0.0078	0.0000	0.0439	-0.0010	108	0.0194	-0.0001	0.0492	-0.0039
45	0.0080	0.0000	0.0519	-0.0001	109	0.0195	-0.0001	0.0487	-0.0008
46	0.0082	0.0000	0.0470	-0.0003	110	0.0198	-0.0001	0.0488	0.0016
47	0.0083	0.0000	0.0480	-0.0013	111	0.0199	-0.0001	0.0461	0.0005
48	0.0086	-0.0001	0.0482	-0.0014	112	0.0201	-0.0001	0.0452	-0.0001
49	0.0087	-0.0001	0.0464	0.0000	113	0.0203	-0.0001	0.0451	0.0012
50	0.0089	-0.0001	0.0453	-0.0003	114	0.0205	-0.0001	0.0424	0.0028
51	0.0091	-0.0001	0.0437	-0.0001	115	0.0206	-0.0001	0.0433	0.0007
52	0.0093	-0.0001	0.0452	0.0001	116	0.0208	-0.0001	0.0437	-0.0004
53	0.0095	-0.0001	0.0457	0.0009	117	0.0210	-0.0001	0.0414	0.0003
54	0.0097	-0.0001	0.0432	-0.0002	118	0.0212	-0.0001	0.0412	0.0006
55	0.0098	-0.0001	0.0418	-0.0005	119	0.0213	-0.0001	0.0431	-0.0005
56	0.0100	-0.0001	0.0432	0.0009	120	0.0215	-0.0001	0.0438	-0.0009
57	0.0101	-0.0001	0.0433	0.0013	121	0.0217	-0.0001	0.0429	0.0009
58	0.0103	0.0000	0.0432	0.0015	122	0.0219	-0.0001	0.0414	0.0013
59	0.0105	0.0000	0.0434	-0.0004	123	0.0220	-0.0001	0.0450	-0.0016
60	0.0107	-0.0001	0.0512	-0.0004	124	0.0222	-0.0001	0.0540	-0.0001
61	0.0109	0.0000	0.0490	0.0005	125	0.0224	-0.0001	0.0475	0.0011
62	0.0111	0.0000	0.0457	-0.0009	126	0.0226	-0.0001	0.0483	0.0002
63	0.0113	-0.0001	0.0466	-0.0010	127	0.0228	-0.0001	0.0499	-0.0006
64	0.0114	-0.0001	0.0463	-0.0003	128	0.0230	-0.0001	0.0467	0.0006

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0232	-0.0001	0.0454	0.0008	190	0.0340	0.0000	0.0444	-0.0003
130	0.0234	-0.0001	0.0448	-0.0015	191	0.0342	0.0000	0.0435	-0.0030
131	0.0235	-0.0001	0.0439	-0.0023	192	0.0344	0.0000	0.0463	-0.0006
132	0.0237	-0.0001	0.0429	0.0011	193	0.0346	0.0000	0.0432	0.0008
133	0.0239	-0.0001	0.0395	0.0008	194	0.0347	0.0000	0.0389	-0.0011
134	0.0240	-0.0001	0.0415	-0.0014	195	0.0349	0.0000	0.0418	-0.0009
135	0.0242	-0.0001	0.0435	0.0009	196	0.0351	0.0000	0.0435	0.0010
136	0.0244	-0.0001	0.0409	0.0012	197	0.0352	0.0000	0.0436	0.0002
137	0.0246	-0.0001	0.0416	-0.0005	198	0.0354	0.0000	0.0417	0.0003
138	0.0247	-0.0001	0.0441	-0.0010	199	0.0355	0.0000	0.0425	0.0010
139	0.0249	-0.0001	0.0459	0.0006	200	0.0357	0.0000	0.0434	0.0008
140	0.0251	-0.0001	0.0450	0.0007	201	0.0359	0.0000	0.0419	0.0003
141	0.0253	-0.0001	0.0493	-0.0002	202	0.0361	0.0000	0.0412	-0.0005
142	0.0255	-0.0001	0.0488	-0.0011	203	0.0362	0.0000	0.0416	0.0010
143	0.0257	-0.0001	0.0487	0.0003	204	0.0364	0.0000	0.0439	0.0018
144	0.0259	-0.0001	0.0456	0.0007	205	0.0366	0.0000	0.0431	0.0002
145	0.0260	-0.0001	0.0464	-0.0005	206	0.0368	0.0000	0.0431	0.0009
146	0.0262	-0.0001	0.0483	0.0003	207	0.0369	0.0000	0.0430	0.0012
147	0.0264	-0.0001	0.0454	0.0009	208	0.0371	0.0000	0.0440	0.0002
148	0.0266	-0.0001	0.0401	0.0006	209	0.0373	0.0000	0.0446	-0.0004
149	0.0267	-0.0001	0.0434	0.0001	210	0.0375	0.0000	0.0410	-0.0008
150	0.0269	-0.0001	0.0447	0.0006	211	0.0376	0.0000	0.0428	-0.0009
151	0.0271	-0.0001	0.0434	0.0021	212	0.0378	0.0000	0.0520	0.0001
152	0.0273	0.0000	0.0418	0.0006	213	0.0380	0.0000	0.0467	-0.0013
153	0.0274	0.0000	0.0412	-0.0010	214	0.0382	0.0000	0.0453	-0.0011
154	0.0276	0.0000	0.0434	0.0006	215	0.0384	0.0000	0.0469	0.0010
155	0.0278	0.0000	0.0418	0.0022	216	0.0385	0.0000	0.0442	0.0011
156	0.0280	0.0000	0.0416	0.0014	217	0.0387	0.0000	0.0435	-0.0007
157	0.0281	0.0000	0.0447	-0.0015	218	0.0389	0.0000	0.0447	-0.0002
158	0.0283	0.0000	0.0530	-0.0005	219	0.0391	0.0000	0.0445	0.0002
159	0.0285	0.0000	0.0483	0.0012	220	0.0393	0.0000	0.0442	0.0004
160	0.0287	0.0000	0.0476	-0.0008	221	0.0394	0.0000	0.0424	-0.0018
161	0.0289	0.0000	0.0469	-0.0017	222	0.0396	0.0000	0.0444	-0.0003
162	0.0291	0.0000	0.0461	0.0010	223	0.0398	0.0000	0.0448	0.0014
163	0.0293	0.0000	0.0438	0.0002	224	0.0399	0.0000	0.0431	0.0006
164	0.0294	0.0000	0.0447	-0.0005	225	0.0401	0.0000	0.0438	0.0004
165	0.0296	0.0000	0.0449	0.0008	226	0.0403	0.0000	0.0450	-0.0007
166	0.0298	0.0000	0.0431	0.0012	227	0.0405	0.0000	0.0427	0.0006
167	0.0300	0.0000	0.0422	0.0001	228	0.0406	0.0000	0.0393	0.0002
168	0.0301	0.0000	0.0433	-0.0015	229	0.0408	0.0000	0.0407	-0.0002
169	0.0303	0.0000	0.0439	-0.0004	230	0.0410	0.0000	0.0441	-0.0007
170	0.0305	0.0000	0.0418	0.0009	231	0.0412	0.0000	0.0429	0.0018
171	0.0307	0.0000	0.0423	0.0003	232	0.0413	0.0000	0.0402	0.0009
172	0.0308	0.0000	0.0436	0.0006	233	0.0415	0.0000	0.0415	-0.0005
173	0.0310	0.0000	0.0441	-0.0005	234	0.0416	0.0000	0.0427	0.0000
174	0.0312	0.0000	0.0415	-0.0010	235	0.0418	0.0000	0.0413	0.0008
175	0.0313	0.0000	0.0416	0.0005	236	0.0420	0.0000	0.0414	0.0005
176	0.0315	0.0000	0.0431	-0.0010	237	0.0422	0.0000	0.0434	-0.0016
177	0.0317	0.0000	0.0431	-0.0018	238	0.0423	0.0000	0.0444	0.0009
178	0.0318	-0.0001	0.0428	-0.0006	239	0.0425	0.0000	0.0447	0.0020
179	0.0320	-0.0001	0.0408	-0.0006	240	0.0427	0.0000	0.0415	-0.0013
180	0.0322	-0.0001	0.0418	-0.0007	241	0.0429	0.0000	0.0450	-0.0013
181	0.0324	-0.0001	0.0453	0.0018	242	0.0430	0.0000	0.0468	0.0005
182	0.0325	0.0000	0.0419	0.0009	243	0.0432	0.0000	0.0485	0.0005
183	0.0327	0.0000	0.0401	-0.0007	244	0.0434	0.0000	0.0453	-0.0004
184	0.0328	0.0000	0.0457	0.0016	245	0.0436	0.0000	0.0481	-0.0001
185	0.0331	0.0000	0.0523	0.0026	246	0.0438	0.0000	0.0476	0.0009
186	0.0333	0.0000	0.0461	0.0005	247	0.0440	0.0000	0.0435	0.0019
187	0.0334	0.0000	0.0479	-0.0014	248	0.0442	0.0000	0.0432	-0.0011
188	0.0336	0.0000	0.0500	0.0003	249	0.0443	0.0000	0.0450	-0.0006
189	0.0338	0.0000	0.0473	0.0030	250	0.0445	0.0000	-	-

Table B3.13 Raw data of free-rising PMMA-3.514-SW in SW

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
1	0.0000	0.0000	-	-	65	0.0181	0.0000	0.0675	-0.0015
2	0.0002	0.0000	0.0727	-0.0021	66	0.0183	0.0000	0.0672	-0.0007
3	0.0006	0.0000	0.0749	-0.0034	67	0.0186	0.0000	0.0705	-0.0002
4	0.0008	0.0000	0.0662	-0.0021	68	0.0189	0.0000	0.0712	0.0010
5	0.0011	0.0000	0.0662	-0.0010	69	0.0192	0.0000	0.0724	0.0016
6	0.0014	0.0000	0.0677	-0.0021	70	0.0195	0.0000	0.0698	0.0006
7	0.0017	0.0000	0.0729	-0.0014	71	0.0197	0.0000	0.0644	-0.0006
8	0.0020	-0.0001	0.0705	-0.0004	72	0.0200	0.0000	0.0718	-0.0002
9	0.0022	-0.0001	0.0732	-0.0009	73	0.0203	0.0000	0.0743	0.0009
10	0.0025	-0.0001	0.0698	-0.0015	74	0.0206	0.0000	0.0753	-0.0007
11	0.0028	-0.0001	0.0613	-0.0015	75	0.0209	0.0000	0.0751	-0.0002
12	0.0030	-0.0001	0.0693	0.0004	76	0.0212	0.0000	0.0682	0.0008
13	0.0033	-0.0001	0.0710	0.0015	77	0.0214	0.0000	0.0648	-0.0006
14	0.0036	-0.0001	0.0726	0.0016	78	0.0217	0.0000	0.0658	-0.0004
15	0.0039	0.0000	0.0767	0.0002	79	0.0220	0.0000	0.0725	-0.0006
16	0.0042	-0.0001	0.0691	-0.0020	80	0.0223	0.0000	0.0741	-0.0014
17	0.0045	-0.0001	0.0659	0.0000	81	0.0226	0.0000	0.0772	0.0001
18	0.0047	-0.0001	0.0666	0.0011	82	0.0229	0.0000	0.0800	0.0000
19	0.0050	-0.0001	0.0699	0.0000	83	0.0232	0.0000	0.0710	-0.0001
20	0.0053	-0.0001	0.0738	-0.0011	84	0.0235	0.0000	0.0678	0.0028
21	0.0056	-0.0001	0.0682	-0.0012	85	0.0237	0.0000	0.0672	0.0014
22	0.0058	-0.0001	0.0668	0.0005	86	0.0240	0.0000	0.0726	0.0011
23	0.0061	-0.0001	0.0681	0.0003	87	0.0243	0.0000	0.0752	0.0003
24	0.0064	-0.0001	0.0718	-0.0006	88	0.0246	0.0000	0.0756	-0.0015
25	0.0067	-0.0001	0.0750	0.0002	89	0.0249	0.0000	0.0783	0.0007
26	0.0070	-0.0001	0.0755	0.0010	90	0.0252	0.0000	0.0687	0.0004
27	0.0073	-0.0001	0.0763	-0.0005	91	0.0255	0.0000	0.0638	0.0004
28	0.0076	-0.0001	0.0669	-0.0016	92	0.0257	0.0000	0.0686	0.0013
29	0.0078	-0.0001	0.0635	-0.0001	93	0.0260	0.0000	0.0755	0.0007
30	0.0081	-0.0001	0.0668	-0.0007	94	0.0263	0.0000	0.0748	0.0008
31	0.0084	-0.0001	0.0712	-0.0015	95	0.0266	0.0000	0.0785	0.0018
32	0.0087	-0.0001	0.0754	0.0005	96	0.0270	0.0000	0.0808	0.0013
33	0.0090	-0.0001	0.0691	0.0013	97	0.0273	0.0000	0.0716	0.0014
34	0.0092	-0.0001	0.0681	0.0014	98	0.0275	0.0000	0.0697	-0.0007
35	0.0095	-0.0001	0.0700	0.0015	99	0.0278	0.0000	0.0690	-0.0025
36	0.0098	-0.0001	0.0716	0.0022	100	0.0281	0.0000	0.0731	-0.0017
37	0.0101	0.0000	0.0737	0.0015	101	0.0284	0.0000	0.0722	-0.0022
38	0.0104	0.0000	0.0753	0.0006	102	0.0287	0.0000	0.0731	-0.0022
39	0.0107	0.0000	0.0784	0.0006	103	0.0290	0.0000	0.0774	-0.0019
40	0.0110	0.0000	0.0685	-0.0007	104	0.0293	0.0000	0.0683	0.0009
41	0.0112	0.0000	0.0619	-0.0005	105	0.0295	0.0000	0.0659	0.0015
42	0.0115	0.0000	0.0659	-0.0005	106	0.0298	0.0000	0.0683	0.0030
43	0.0118	0.0000	0.0687	0.0004	107	0.0301	0.0000	0.0742	0.0021
44	0.0121	0.0000	0.0713	0.0016	108	0.0304	0.0000	0.0779	-0.0005
45	0.0123	0.0000	0.0692	0.0010	109	0.0307	0.0000	0.0793	0.0007
46	0.0126	0.0000	0.0698	0.0003	110	0.0311	0.0000	0.0788	-0.0005
47	0.0129	0.0000	0.0720	0.0000	111	0.0313	0.0000	0.0694	0.0005
48	0.0132	0.0000	0.0735	0.0010	112	0.0316	0.0000	0.0680	-0.0010
49	0.0135	0.0000	0.0726	0.0013	113	0.0319	0.0000	0.0699	-0.0015
50	0.0138	0.0000	0.0748	0.0001	114	0.0322	0.0000	0.0744	0.0003
51	0.0141	0.0000	0.0802	-0.0005	115	0.0325	0.0000	0.0739	-0.0014
52	0.0144	0.0000	0.0717	-0.0020	116	0.0328	0.0000	0.0768	0.0000
53	0.0147	0.0000	0.0653	-0.0002	117	0.0331	0.0000	0.0790	0.0007
54	0.0149	0.0000	0.0674	0.0012	118	0.0334	0.0000	0.0768	0.0030
55	0.0152	0.0000	0.0693	0.0000	119	0.0337	0.0000	0.0728	0.0032
56	0.0155	0.0000	0.0692	0.0006	120	0.0340	0.0000	0.0645	0.0016
57	0.0158	0.0000	0.0650	0.0003	121	0.0342	0.0000	0.0690	0.0000
58	0.0160	0.0000	0.0649	0.0009	122	0.0345	0.0000	0.0737	-0.0015
59	0.0163	0.0000	0.0701	0.0003	123	0.0348	0.0000	0.0759	0.0000
60	0.0166	0.0000	0.0748	0.0014	124	0.0351	0.0000	0.0790	-0.0004
61	0.0169	0.0000	0.0754	0.0004	125	0.0355	0.0000	0.0796	0.0008
62	0.0172	0.0000	0.0778	-0.0008	126	0.0358	0.0000	0.0778	-0.0007
63	0.0175	0.0000	0.0785	0.0016	127	0.0361	0.0000	0.0702	-0.0016
64	0.0178	0.0000	0.0707	-0.0003	128	0.0363	0.0000	0.0661	-0.0005

Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$	Nr.	$y\ (m)$	$x\ (m)$	$v_y\ (m/s)$	$v_x\ (m/s)$
129	0.0366	0.0000	0.0665	0.0003	173	0.0497	0.0000	0.0797	0.0006
130	0.0369	0.0000	0.0729	0.0002	174	0.0500	0.0000	0.0824	0.0004
131	0.0372	0.0000	0.0762	-0.0006	175	0.0503	0.0000	0.0799	-0.0006
132	0.0375	0.0000	0.0770	0.0005	176	0.0507	0.0000	0.0752	-0.0004
133	0.0378	0.0000	0.0808	-0.0008	177	0.0509	0.0000	0.0669	0.0000
134	0.0381	0.0000	0.0716	0.0002	178	0.0512	0.0000	0.0676	-0.0003
135	0.0384	0.0000	0.0701	-0.0001	179	0.0515	0.0000	0.0712	-0.0007
136	0.0387	0.0000	0.0738	-0.0005	180	0.0518	0.0000	0.0718	0.0002
137	0.0390	0.0000	0.0734	0.0001	181	0.0521	0.0000	0.0761	-0.0007
138	0.0393	0.0000	0.0739	-0.0016	182	0.0524	0.0000	0.0711	-0.0006
139	0.0396	0.0000	0.0753	-0.0002	183	0.0526	0.0000	0.0672	-0.0006
140	0.0399	0.0000	0.0786	-0.0003	184	0.0529	0.0000	0.0692	0.0000
141	0.0402	0.0000	0.0792	0.0002	185	0.0532	0.0000	0.0742	-0.0012
142	0.0405	0.0000	0.0692	0.0015	186	0.0535	0.0000	0.0769	-0.0022
143	0.0407	0.0000	0.0617	0.0016	187	0.0538	0.0000	0.0828	-0.0012
144	0.0410	0.0000	0.0700	-0.0003	188	0.0542	0.0000	0.0843	0.0004
145	0.0413	0.0000	0.0755	-0.0022	189	0.0545	0.0000	0.0802	0.0012
146	0.0416	0.0000	0.0786	-0.0004	190	0.0548	0.0000	0.0811	0.0005
147	0.0419	0.0000	0.0777	-0.0009	191	0.0551	0.0000	0.0778	-0.0008
148	0.0422	0.0000	0.0770	0.0002	192	0.0554	0.0000	0.0784	-0.0008
149	0.0425	0.0000	0.0781	0.0003	193	0.0557	0.0000	0.0703	-0.0005
150	0.0428	0.0000	0.0694	0.0005	194	0.0560	0.0000	0.0643	-0.0015
151	0.0431	0.0000	0.0719	0.0015	195	0.0563	-0.0001	0.0691	-0.0003
152	0.0434	0.0000	0.0760	-0.0006	196	0.0565	-0.0001	0.0748	-0.0004
153	0.0437	0.0000	0.0721	-0.0012	197	0.0569	-0.0001	0.0789	-0.0005
154	0.0440	0.0000	0.0746	-0.0018	198	0.0572	-0.0001	0.0805	-0.0012
155	0.0443	0.0000	0.0790	-0.0008	199	0.0575	-0.0001	0.0809	-0.0016
156	0.0446	0.0000	0.0779	-0.0002	200	0.0578	-0.0001	0.0799	-0.0016
157	0.0449	0.0000	0.0770	0.0014	201	0.0581	-0.0001	0.0808	-0.0022
158	0.0452	0.0000	0.0718	0.0013	202	0.0585	-0.0001	0.0733	-0.0036
159	0.0455	0.0000	0.0625	-0.0002	203	0.0587	-0.0001	0.0681	-0.0034
160	0.0457	0.0000	0.0682	0.0003	204	0.0590	-0.0001	0.0706	-0.0009
161	0.0460	0.0000	0.0727	-0.0007	205	0.0593	-0.0001	0.0704	-0.0021
162	0.0463	0.0000	0.0776	-0.0021	206	0.0596	-0.0001	0.0727	-0.0014
163	0.0467	0.0000	0.0831	-0.0012	207	0.0599	-0.0001	0.0764	-0.0011
164	0.0470	0.0000	0.0813	0.0007	208	0.0602	-0.0001	0.0795	-0.0020
165	0.0473	0.0000	0.0818	-0.0017	209	0.0605	-0.0001	0.0819	-0.0008
166	0.0476	0.0000	0.0797	-0.0013	210	0.0608	-0.0001	0.0756	-0.0003
167	0.0480	0.0000	0.0713	-0.0006	211	0.0611	-0.0001	0.0674	-0.0009
168	0.0482	0.0000	0.0660	-0.0006	212	0.0614	-0.0002	0.0697	-0.0001
169	0.0485	0.0000	0.0696	-0.0001	213	0.0617	-0.0001	0.0759	0.0003
170	0.0488	0.0000	0.0719	-0.0010	214	0.0620	-0.0001	0.0761	-0.0010
171	0.0491	0.0000	0.0754	0.0010	215	0.0623	-0.0002	0.0753	-0.0026
172	0.0494	0.0000	0.0781	0.0005	216	0.0626	-0.0002	-	-

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