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Paleogeography of Early Paleozoic Laurentia and Meguma, Avalonia terranes via paleomagnetism and faunal review

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Abstract

Paleomagnetic assessment of 821 Cambrian to Silurian-aged rock specimens of igneous and sedimentary origin was used as a means to provide insight on the ancient geographies of the region in which these rocks are currently found. The Earth's magnetic field direction can be recorded at the time of rock formation and/or at a later significant event by magnetic minerals, allowing these signatures to be used to track the past motions of the continents. Stepwise demagnetization of the Port au Port, St. George and Table Head Groups in western Newfoundland, and the Mavillette gabbro (426 +/- 2 Ma, U-Pb baddeleyite) of southwestern Nova Scotia has revealed an overprint magnetization (D=161º, I=4º; D=155º, I=8º) that was acquired when Laurentia and the accreted Meguma terrane were near the equator during the Mid-to-Late Paleozoic. The effects of the Alleghenian orogeny may have been responsible for a significant overprint event during the Carboniferous that resulted in remagnetization of these rocks.

Keywords
Laurentia, Meguma, Avalonia, paleogeography, paleomagnetism, Paleozoic, Silurian, Ordovician, Cambrian, paleoclimate, supercontinent cycle, global geodynamics, Port au Port, Mavillette

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CHAPTER 1

1.1 Introduction to paleogeographic reconstruction

Present-day North America differs greatly from ancestral North America in terms of paleoclimate, geographic location and dominant fauna and flora. During the Late Precambrian, the Laurentian continent, representative of ancestral North America, underwent a widespread rifting event around its margins during the breakup of the supercontinent Rodinia, eventually forming an oceanic basin offshore relative to its present eastern margin (Cocks and Torsvik 2011). The short-lived Iapetus Ocean, a precursor to the Atlantic Ocean, would occupy this basin during the Early Paleozoic Era (Cawood et al. 2001). Ultimately, the supercontinent Pangaea would begin to form in the Paleozoic, with exotic crustal terranes being added to this region prior to continental collision (Murphy et al. 2004; Mitchell et al. 2012).

Some of the paleogeography that is known for the Paleozoic Era is based on paleomagnetic data, giving distance and direction to the pole for certain localities. The analysis of magnetic minerals in rocks has been widely used in paleogeographic reconstructions, as information regarding the paleolatitude of the regions containing the rocks can be determined. During the time of their formation, magnetic minerals can record the ambient Earth's magnetic field at that locality (Butler 1992). These magnetic markers can then be used to determine the locations of the Earth's poles, the magnetic field intensity and the position of the equator for that time period (Jin et al. 2013), providing vital information for paleogeographic reconstructions, allowing for interpretations of the continents' motions throughout time. However, some of the motions of the continents and terranes are not well understood for certain time periods due to gaps in the paleomagnetic record (Figure 1.1; Torsvik et al. 2012).

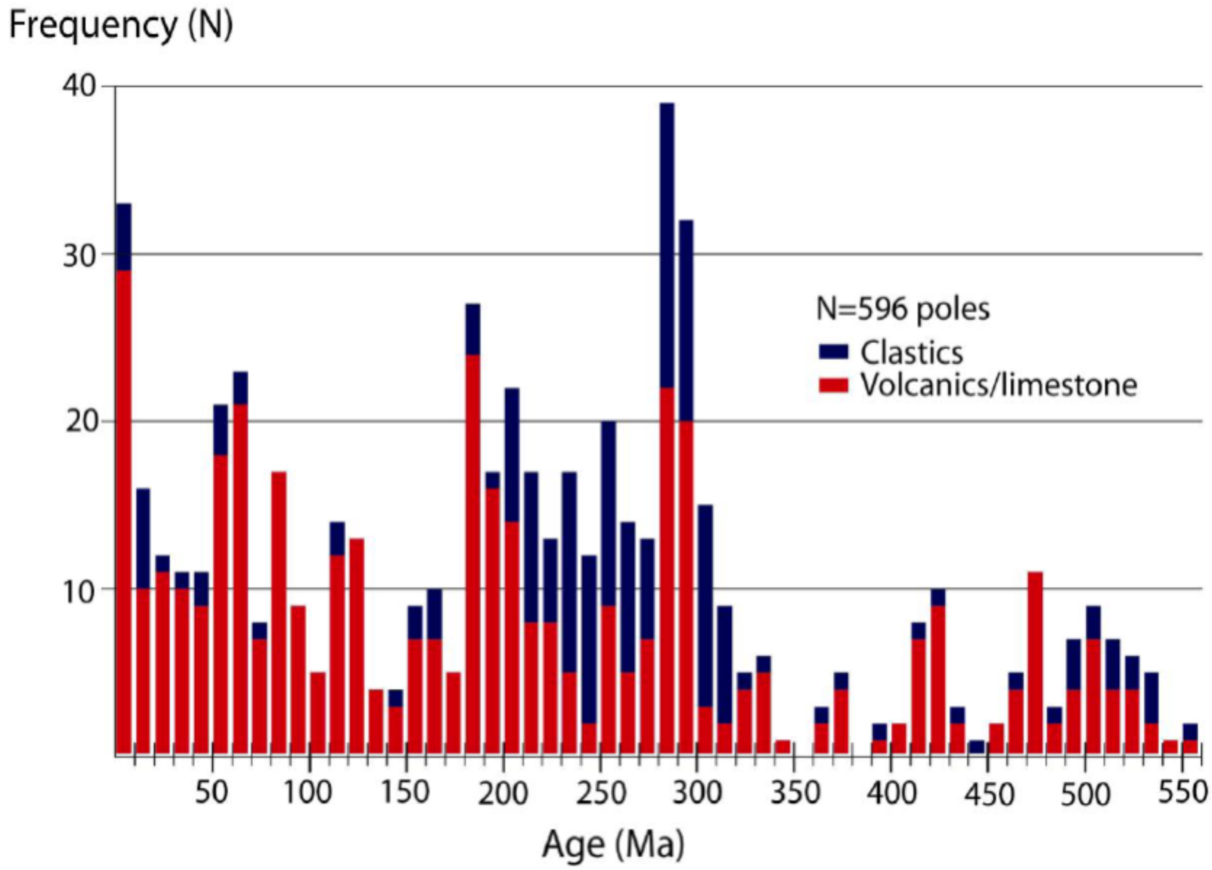

Fig.1.1. Age frequency histogram of paleomagnetic poles for the Paleozoic Era to present-day, with distinctive gaps in the paleomagnetic record (Carboniferous and Devonian periods) (Torsvik et al. 2012).

In the case of ancient North America as a whole, the paleogeographic history during the Early Paleozoic is highly debated, as the gap in viable paleomagnetic data has resulted in inconsistent interpretations (Stampfli and Borel 2002; Murphy et al. 2004; McCausland et al. 2007; Mitchell et al. 2012). Previous studies have attempted paleogeographic reconstructions, but magnetic overprinting from the present-day magnetic field and pervasive Late Paleozoic remagnetizations rendered much of the data difficult to rely upon, or unusable. Among the several regions without paleomagnetic data for this time period are the Avalonia and Meguma terranes. These terranes represent the culmination of the Appalachian collisions, resulting in the formation of Pangaea: The Laurentian margin on one end and Avalonia/Meguma being the outermost crustal blocks on the opposite end of the Appalachian collision zone prior to the arrival of Africa.

Previous paleomagnetic studies in the Meguma terrane have been largely unsuccessful due to intense metamorphism of the region; as a result, little is known about the origin and drift history of the terrane. More generally, the lack of usable paleomagnetic data for the Paleozoic Era, has led to unreliable global paleogeographic reconstructions, as a result of errors associated with data interpolation (Stampfli and Borel 2002; Torsvik et al. 2012). This is especially true in the case of the land masses that once bordered the Iapetus Ocean, including regions in present-day Atlantic Canada (Cawood et al. 2001; McCausland et al. 2007).

1.2 Relevant Paleozoic paleocontinents and micro-continents

1.2.1 Rodinia

Rodinia was an Early-Neoproterozoic supercontinent (Figure 1.2) that was assembled through global orogenic events, resembling Pangaea in the Mesozoic (Dalziel 1997). The eventual

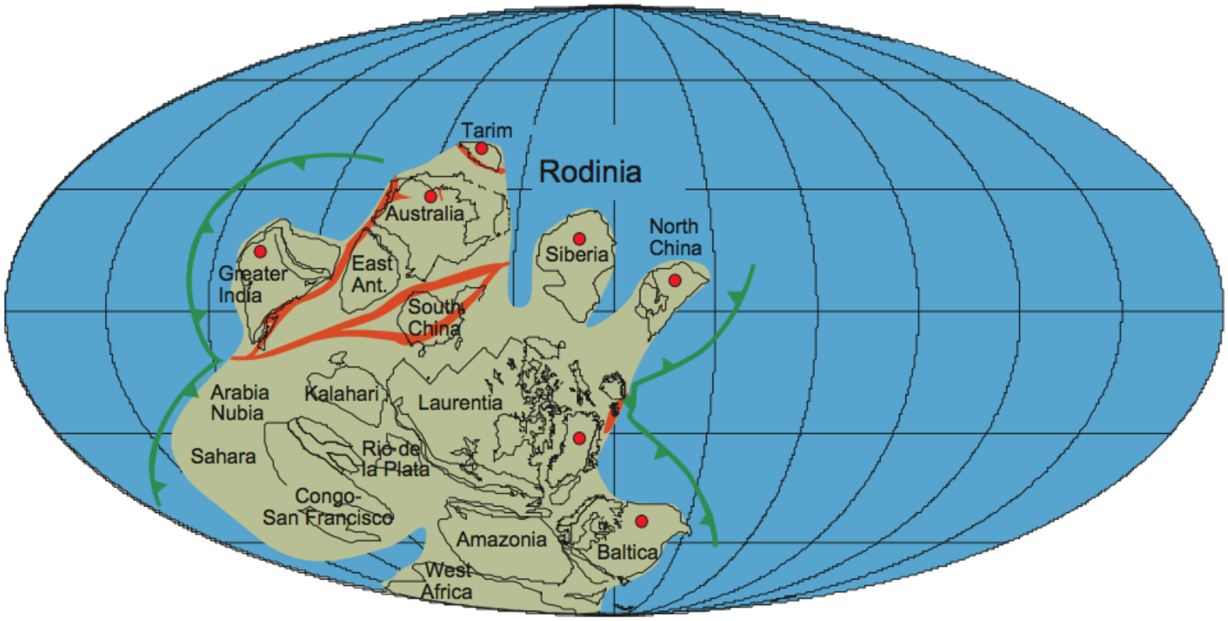

Fig.1.2. Simplified geodynamic map of Rodinia in the Neoproterozoic Era, approximately 900 Ma (Kuang. 2014).

breakup of this land mass would give way to the Iapetus Ocean, separating Laurentia from some continental elements of Gondwana (Dalziel 1997; Cawood, McCausland and Dunning 2001).

1.2.2 Laurentia

The Laurentian paleocontinent consisted of much of present North America as well as Greenland and the northern portion of the British Isles (Fortey and Cocks 2003) and is representative of the core ancestral North America. The paleogeographic position of Laurentia during the Early Paleozoic Era has been universally agreed upon, as the craton securely straddled the equator (based on available paleomagnetic data) and the pervasive occurrence of carbonate deposits across the continent (Van der Voo 1993; Fortey and Cocks 2003; Cocks and Torsvik 2011; Jin et al. 2013; Torsvik et al. 2012). According to Fortey and Cocks (2003), Laurentia was a very stable land mass with minimal intracratonic movement this time; therefore, reconstructions have been modelled on an assumption of a nearly stationary latitudinal position (Figure 1.3).

1.2.3 Gondwana

Gondwana was an enormous paleocontinent (Figure 1.3), covering approximately 20% of the Earth's surface in the Early Paleozoic. The land mass covered an area of ~100 million km^2, comprising the now-separate land masses of present-day South America, Africa, Australia, Antarctica, India and Arabia (Torsvik and Cocks 2013; Torsvik et al. 2012). Paleogeographic reconstructions have placed the majority of Gondwana in the southern hemisphere, with West Gondwana positioned almost directly on the geographic South Pole (Cocks 2001; Cocks and Torsvik 2002; Fortey and Cocks 2003).

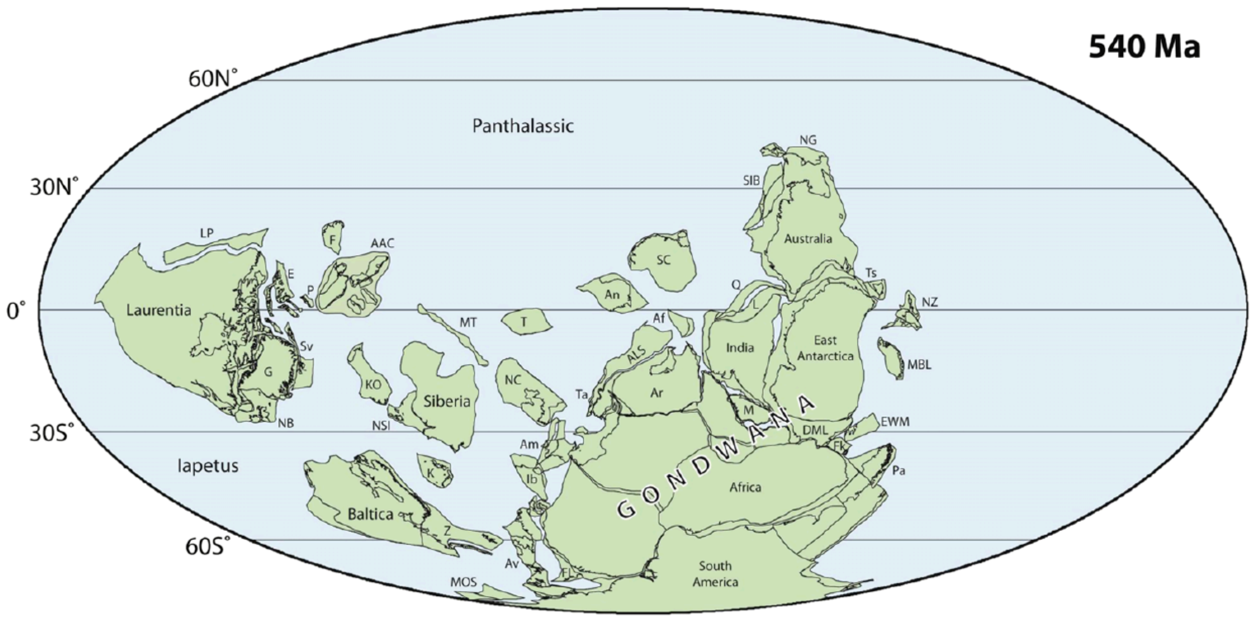

Fig.1.3. Global paleogeographic reconstruction for the Cambrian period (Torsvik and Cocks 2013). Laurentia holds an equatorial position, while Gondwana stretches from the South Pole into the northern hemisphere.

1.2.4 Avalonia

The Avalon terrane was once a part of the vast paleocontinent of Gondwana and now constitutes present-day: eastern Newfoundland, New Brunswick, northern Nova Scotia, parts of eastern coastal United States, Wales, Scotland, Ireland, England, Germany and Belgium (Cocks, McKerrow and van Staal 1997; Fortey and Cocks 2003). The terrane rifted from Gondwana during the Middle Ordovician and drifted towards Laurentia prior to its collision with Baltica in the Late Ordovician (Figure 1.4).

1.2.5 Meguma

The Meguma terrane, similar to Avalonia, was a peri-Gondwana terrane in the Early Paleozoic before accreting onto the Avalonian portion of the Laurentian paleocontinent (Figure 1.5). The terrane comprises present-day southern Nova Scotia and has been correlated with parts of West Africa (Schenk 1997; Waldron et al. 2009). The exact origin and drift history of Meguma is not well-constrained, as original paleomagnetic signatures of Meguma rocks appear to have been typically overprinted by remagnetization events associated with pervasive deformation and metamorphism.

In the cases of poor paleomagnetic data, the use of diagnostic fossils has become increasingly important in paleogeographic reconstructions. Faunal provinces, defined by faunal assemblages endemic to a certain geographic area, can be used to track movement of terranes when they rift from one region and drift to a vastly different one. In the case of Meguma, faunal provinces based on shallow water trilobite species have linked the Meguma terrane to West Gondwana in the Early Ordovician; the *Calymenacean-dalmanitacean* province comprised of unique cool-water trilobite fossils are found in present-day Morocco and West Africa (Whittington and Hughes 1972; Fortey and Cocks 1992; Fortey and Cocks 2003; Winrow and Sutton 2014;

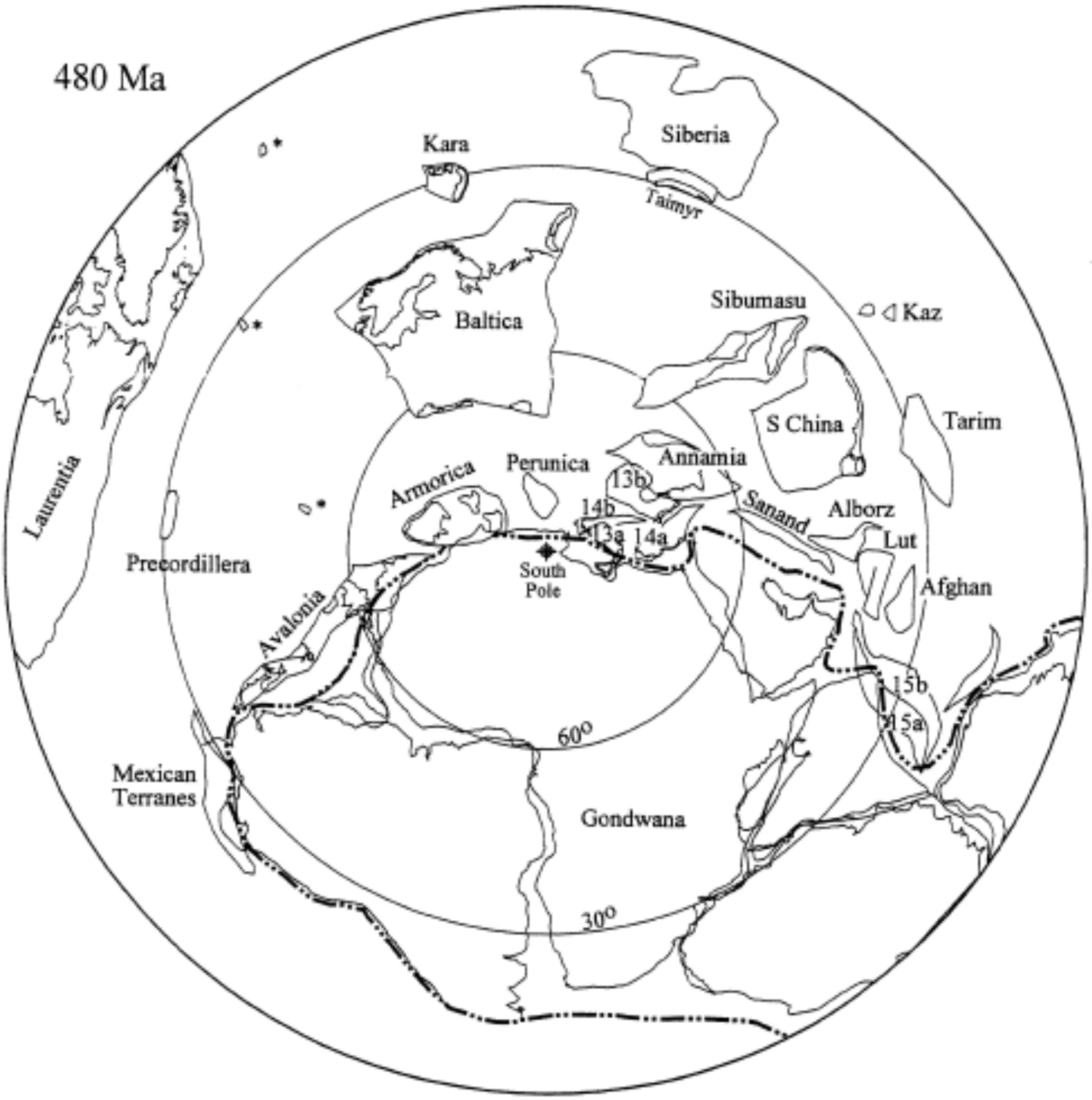

Fig.1.4. Ordovician paleogeography as viewed from the South Pole (Cocks and Torsvik 2002). Avalonia is interpreted to have been a part of or in close proximity to Gondwana at this time.

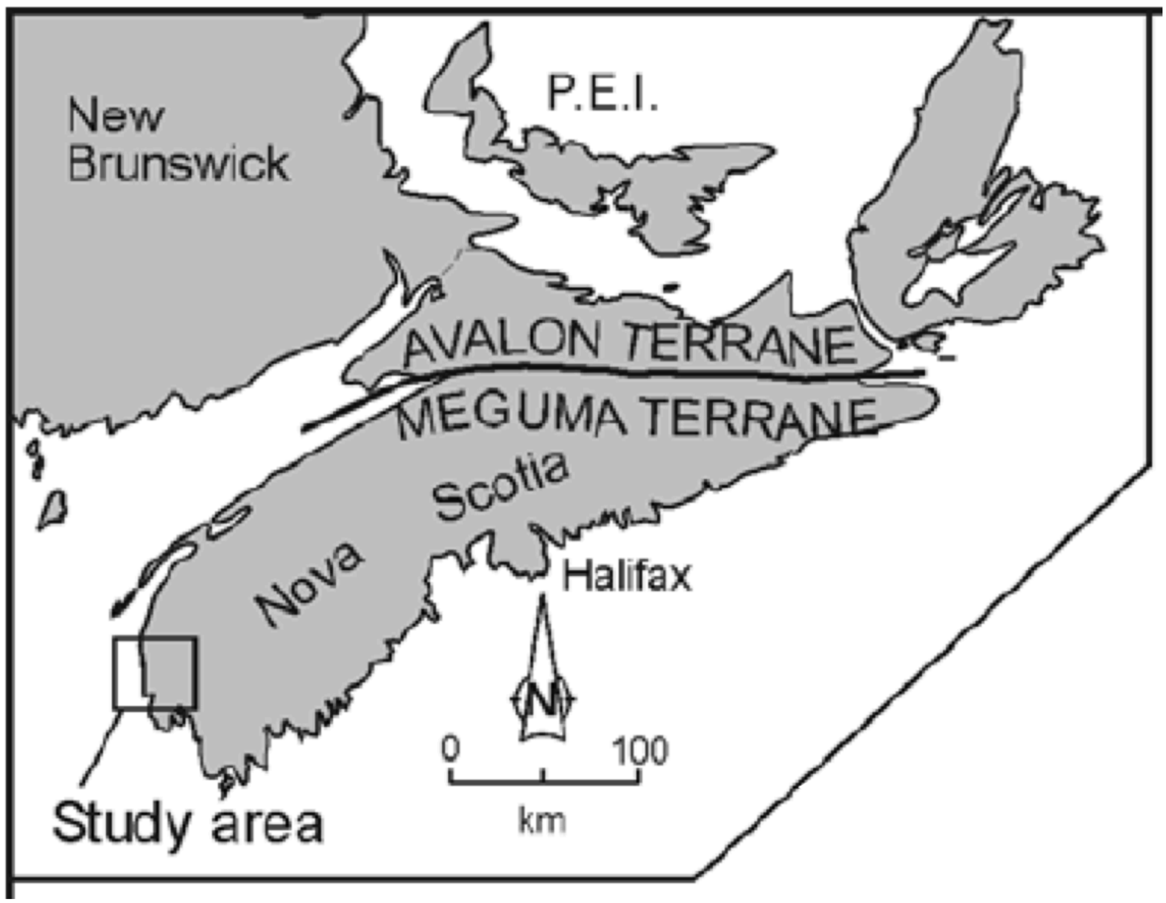

Fig.1.5. The contact between the Avalon and Meguma terranes following collision in the Mid-Late Paleozoic Era (White, Barr and Gould 2002).

Fortey and Cocks 2016). Fossil assemblages of Meguma for the Early Paleozoic, however, mainly consists of deep water trilobite species with only subtle (species-level) taxonomic differences and minimal endemicity for deep water trilobite assemblages of either side of the Iapetus Ocean. In other words, the tendency of deeper water organisms to have a more cosmopolitan (i.e., less endemic) distribution limits the usefulness of faunal data for paleogeographic reconstructions.

The severe reduction in faunal diversity that culminated in the Ordovician-Silurian mass extinction further inhibits the identification of faunal provinces that could otherwise reveal directions of drift for landmasses. The substantial change in marine fauna associated with severe paleoclimatic changes during the Late Ordovician is well illustrated by brachiopod assemblages (Cocks 2000; Villas et al. 2002; Cocks and Jia-yu 2008; Candela 2015), which record an invasion of typical cool water fauna found in higher latitudes into tropical regions like Laurentia (Jin 2003). The widespread plunge in oceanic temperatures during this time was such that the distinction between warm- versus cold water faunas was effectively removed, thus greatly hinders the identification of latitudinally distinct faunal provinces.

1.3 Regional geology

The Lower Paleozoic stratigraphy of North America, including western Newfoundland, is heavily dominated by carbonates, both in autochthonous and allochthonous rock sequences (Williams 1979). The accretion of island arcs and exotic terranes onto Laurentia are documented in the stratigraphy, as volcanic and clastic sediments associated with foreland basin development of Mid-Upper Paleozoic age are observed.

1.4 Orogenic events in the Paleozoic Era

Three main mountain-building events, collectively referred to as the Appalachian Orogeny, are observed in the geological record of Laurentia. The constituent orogenic phases, called as the

Taconic, Acadian and Alleghenian orogenies represent the destruction of various ancient oceans as terranes and eventually Africa (as part of Gondwana) sequentially collided with Laurentia (Murphy and Keppie 2005). Beginning in the Ordovician period, various island arcs, terranes, and eventually paleocontinents collided with ancient North America. The composite orogenic belt ranges 3000 km along the eastern margin of North America, from present-day Alabama to Newfoundland (Williams 1979; van Staal et al. 1998).

1.4.1. Taconic Orogeny

Between the Late Cambrian and the Late Ordovician, several volcanic arcs accreted onto the Laurentian margin, creating the Taconic orogenic belt (van Staal et al. 2007). The orogeny can be divided into three phases: Taconic I, Taconic II, and Taconic III. During Taconic I the Lushs Bight island arc accreted onto the Dashwoods terrane 500 to 493 million years ago. The Dashwoods terrane was comprised of land masses that originated in Laurentia and was located off the Laurentian margin (Waldron and van Staal 2001). The second and main phase of the orogeny, Taconic II, was marked by the arrival of the Dashwoods terrane and three volcanic arcs (Notre Dame, Ascot, Snooks Arm) at Laurentia. During the final phase, Taconic III, peri-Gondwanan volcanic arcs accreted onto the Dashwoods portion of Laurentia, forming a narrow belt along the edge of the craton.

1.4.2 Acadian Orogeny

The Acadian Orogeny is interpreted to be the result of the Avalonia colliding with Laurentia during the Devonian. The mountain range, which stretched from present-day New York State to Newfoundland, developed on an Andean-type margin (Murphy and Keppie 2005). The orogenic activity was most intense in parts of New England and Maine, as evidenced by severe deformation. Deformation in Newfoundland is limited, as Silurian-aged deformation caused by the

Alleghenian orogeny is more pervasive (Murphy and Keppie 2005). The collision is related to the closure of the Iapetus Ocean (Figure 1.6).

1.4.3 Alleghenian Orogeny

The closure of the Rheic Ocean, which had once separated Gondwana and Laurentia, resulted in the largest collisional orogenic belt of the Paleozoic Era (Nance et al. 2010). The formation of Pangaea was a product of the Laurentian carbonate platform becoming buried by foreland basin deposits as the Gondwanan margin became sutured to Laurentia. There was significant metamorphism and magmatism associated with the mountain-building event, which drastically altered the sedimentary, structural and tectonothermal record of the Paleozoic Era (Nance et al. 2010).

1.4.4 Effects on paleomagnetism

Orogenic events may be responsible for the remagnetization of rocks, especially carbonates, as the migration of fluids associated with tectonically induced stresses may alter the magnetic signature (Van der Voo 1993). There are numerous proposed mechanisms in which fluid flow remagnetize minerals. The most accepted mechanism envisaged for the rocks of the northern Appalachians involves the lateral migration of basinal fluid, in which fluid movement results in heat transfer, that in turn, causes magnetic minerals to acquire a secondary magnetization (McCabe and Elmore 1989). However, as sedimentary basins often contain some impermeable strata (i.e. shale) that would have inhibited fluid flow (at least vertically), other mechanisms have been proposed (McCabe and Elmore 1989). Faults and fractures caused by deformation related to orogenic activity could have allowed vertical movement of fluid from which precipitation of magnetic minerals could have occurred. Additionally, uplift may have exposed the rocks to meteoric fluids that, upon interaction with the rocks, could have imposed a magnetic overprint.

Fig.1.6. Closure of the Iapetus Ocean as the Avalon terrane and Baltica began to collide with Laurentia to produce the Acadian orogeny (Nance et al. 2010).

Remagnetization resulting from either mechanism would have resulted in the rocks having recorded magnetic fields younger than their original signatures. In the case of the Appalachian orogeny, a Carboniferous age would be expected for the magnetic overprint.

1.5 Previous studies

Previous paleomagnetic studies from the Port au Port Peninsula reported primary and overprinted results for the overlying Early Ordovician St. George and Table Head Groups (Prasad 1986; Deutsch and Prasad 1987; Hodych 1989; Beaubouf et al. 1990). Primary directions are supported by a positive fold test (Hodych 1989) and contribute to the resolution of Laurentian paleopoles for the Early Ordovician (e.g., Torsvik et al. 2012). Additionally, the reported overprint results suggest that particular ancient magnetic directions were likely overprints acquired during the Taconic and Alleghenian orogenies. Fluid migration associated with the mountain building processes may have altered the magnetic signature of the rocks, resulting in remagnetization and acquisition of new, secondary remanence. McCabe and Elmore (1986) reviewed several North American Paleozoic paleomagnetic studies that evidenced remagnetization as a result of orogenic activity.

Prasad (1986) conducted a reconnaissance study on the Port au Port Peninsula, in which few specimens appeared to carry a primary remanence when tilt corrections were applied. Demagnetization of 19 Port au Port Group specimens resolved in a component that most closely matched up with the Cambrian APWP for Laurentia, implying remanence acquisition during or shortly after deposition. A second component was also resolved in those specimens that was interpreted to have been acquired during the Carboniferous, related to the Alleghenian orogeny. Chapter 3 of this thesis aims to complement Prasad's work from 1986 on the peninsula by adding new paleomagnetic results for the Port au Port Group, in addition to the St. George and Table Head groups.

1.6 Study Areas

1.6.1. Port au Port Peninsula, Newfoundland, Canada

Carbonate specimens from five localities (see Figures 6 and 7 in Chapter 3) along the peninsula were included in this study. These localities on the western portion of Newfoundland represent the carbonate platform of Laurentia during the Cambrian and Ordovician, when the craton held an equatorial position (Torsvik and Cocks 2013).

1.6.2. Mavillette, Nova Scotia, Canada

Three localities in southwestern Nova Scotia were sampled for this study (see Figure 3 in Chapter 4). They represent the two limbs of the southwest-plunging regional syncline. The gabbroic sill represents the Meguma terrane, interpreted to have originated in West Gondwana, before accreting onto Laurussia (Laurentia, Avalonia and Baltica) in the Devonian (Pe Piper and Jansa 1999).

1.7 Objectives of current research and rationale

The paleogeographic history of present-day North America, from the breakup of supercontinent Rodinia in the Proterozoic Era, to the assembly of Pangaea in the Paleozoic Era, remains poorly understood. One reason for this results from a lack of viable paleomagnetic data, due to magnetic overprinting, which has led to the interpolation of data over large temporal gaps in an attempt to reconstruct global paleogeography. There is currently a 40-million-year gap in the record, in which paleomagnetic data for North America is sparse (Figure 1; Torsvik et al. 2012).

This thesis examines paleomagnetic data from Cambrian, Ordovician and Silurian-aged rock specimens in an attempt to reconstruct Early Paleozoic Laurentian paleogeography. The overall objectives of the research are to determine a paleolatitude for Laurentia during the Cambrian period and for the Meguma terrane during the Silurian period. By achieving these objectives, the paleogeography of the regions surrounding the Iapetus Ocean can become more refined. Laurentia and Meguma represent the bookends of the Appalachian collisions, marking the opening and closure of the Iapetus Ocean, in addition to the breakup and formation of Rodinia and Pangaea, respectively. The contribution of viable paleomagnetic results from these time periods may help provide answers regarding the paleopositions of the regions that once bordered the Iapetus Ocean.

The following Chapter will provide an overview of the methodology and paleomagnetic techniques involved in this thesis. Chapter 3 will investigate the Cambrian-aged carbonates of the Port au Port Group in western Newfoundland, Canada and attempt to report an ancient magnetic remanence carried by the limestone and dolostone specimens. It will also include a reassessment of published paleomagnetic results for the overlying Ordovician carbonates of the St. George and Table Head Groups. Chapter 4 will investigate the Silurian-aged gabbroic intrusion in southeastern Nova Scotia, Canada and attempt to report an ancient remanence, in addition to radiometrically dating the intrusion through uranium-lead geochronology.

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CHAPTER 2 – Methodology

2.1 Introduction

The primary objective of paleomagnetic research is to obtain a record of past configurations of the geomagnetic field. Particular magnetic minerals, such as goethite, magnetite, hematite, etc., are capable of acquiring and recording remanent magnetizations that represent the geomagnetic field direction at the time of mineral formation. Ancient magnetic field directions can be used to determine the location of the Earth's magnetic poles, the field intensity and the position of the equator for that time period (Jin et al. 2013). This directional information allows for interpretations of the continents' motions throughout time and paleogeographic reconstructions to be made.

The methodology associated with paleomagnetic investigations include oriented rock sample collection, sample preparation and sample analysis. The studies in this thesis were subjected to the same standard paleomagnetic techniques that will be explained in further detail in this chapter.

2.2 Sample collection

Ideal samples for paleomagnetic studies are fresh, unweathered rocks that have undergone very little-to-no alteration or deformation. Samples should be collected from a range of localities in order to ensure proper representation of the the target rock. Typical paleomagnetic studies sample from at least ten sites, in which a site represents a particular rock unit, and a rock unit is a sequence of beds in the case of sedimentary rocks or cooling units in the case of igneous rocks (Butler 1992). A site normally produces six-to-eight samples, which are removed from outcrop in one of two ways: block sampling and drill core sampling. In the case of block sampling, strike and dip measurements are taken before fist-sized blocks are chiseled out of outcrop (Figure 2.1). Each block sample produces two-to-four specimens after preparation in the laboratory. With drill core

Fig.2.1. Oriented block sampling in which strike and dip measurements are taken prior to removal from outcrop.

sampling, a gasoline-powered portable drill is used to extract six-to-eight cores per site, with the core measuring 2.5 cm in diameter. Each drill core sample is oriented using an orientation stage and compass prior to removal from outcrop, in order to determine a structural setting. The orientation stage measures inclination and declination, similar to a Brunton compass in block sampling, which are used to determine the azimuth of the core axis (Figure 2.2). Orientation is essential in both block and drill core sampling, as it allows for an unambiguous *in situ* geographic orientation to be determined for each individual sample. Subsequent laboratory measurements are made with reference to these coordinate axes such that site-level results can be compared in geographic coordinates. Field observations are also made for both block and drill core sampling, including sketches of the surrounding area, specific qualitative observations regarding each block/core, as well as bedding orientations for tilt correction of paleomagnetic directions, if necessary.

2.3 Sample preparation

Samples must be adequately prepared before demagnetization techniques are applied. Sample preparation prior to magnetic analysis differs slightly between block samples and drill core samples. Block samples are elevated by balancing them on top of pieces of scrap rock chips in aluminum trays. This is done to ensure that the oriented top surface of the sample is level and horizontal before the sample is mounted in plaster. The oriented and now horizontal sample is then drilled and cores are produced. Drilled cores are cut into specimens of appropriate dimensions for measurement, approximately 10 cm^3. The specimens are then weighed and measured for magnetic susceptibility. Sample numbers indicate the site, core and specimen number; for example, PP010703 delineates specimen 3 of core 7 from site 1 of the Port au Port Group. All preparation was completed in the Western Paleomagnetic and Petrophysical Laboratory.

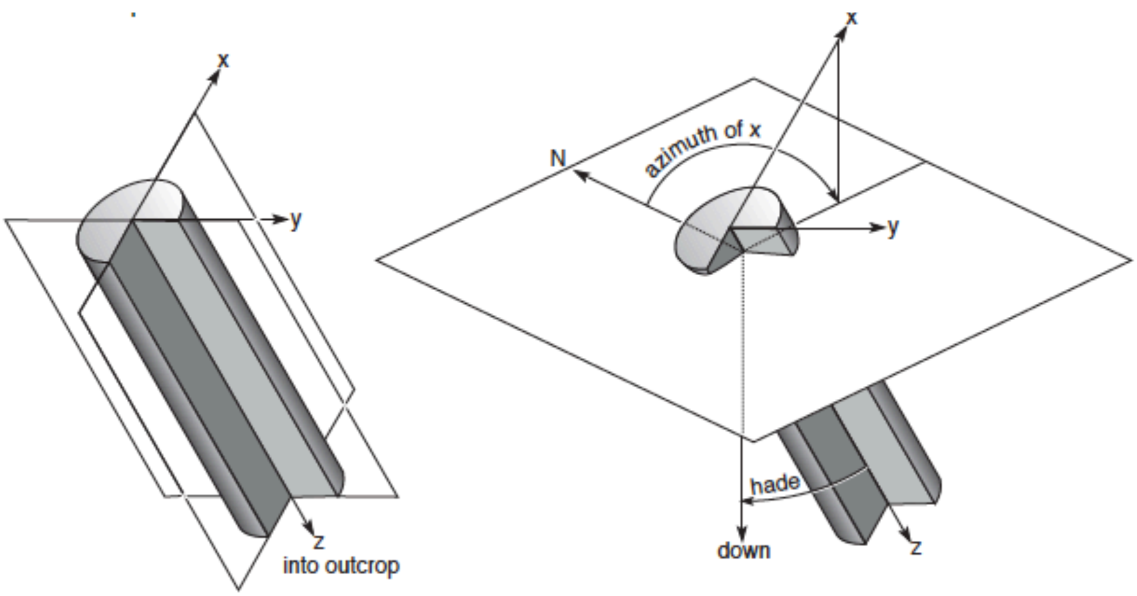

Fig.2.2. Oriented drill core sampling using an orientation stage to determine the azimuth of the core axis (Butler 1992).

2.4 Magnetic analysis

2.4.1 – Rock magnetism

Magnetic minerals, such as magnetite, contain magnetic domains in which remanence is held. The domains can be classified as single-domain (SD), multi-domain (MD), and pseudo-single-domain (PSD). SD grains are very efficient carrier of remanent magnetization, as they contain uniform magnetization and are, therefore, ideal for paleomagnetic studies (Butler 1992). The size of the mineral grain typically correlates with the number of domains, making smaller grains more likely to contain a SD. MD grains are defined as grains with diameters exceeding 10μm and are typically very poor recorders of magnetic remanence (Butler 1992). The size PSD grains ranges between 1-10 μm and contain fewer magnetic domains than MD grains. Many magnetic grains within igneous and sedimentary rocks fall within this range, with only a small fraction of the grains exhibiting true SD behaviour (Butler 1992). Similar to SD grains, PSD grains are also important carriers of remanent magnetization and are useful in paleomagnetic investigations.

The natural remanent magnetization (NRM) of a specimen is the remanent magnetization that exhibits prior to demagnetization techniques, and is a record of some geomagnetic field direction that has acted on the magnetic minerals in outcrop. The NRM is comprised of primary and secondary remanent components. Primary remanence is defined as the magnetization acquired during the formation of the rock, in which the ambient Earth's magnetic field is recorded at that locality (Butler 1992). Secondary remanence is defined as any magnetization that is acquired following rock formation. Secondary remanence may be removed via demagnetization techniques, and primary remanence may revealed.

Paleomagnetic techniques attempt to remove low stability components, in turn isolating the highest stability component of NRM. Low stability components are removed during earlier steps of demagnetization and are generally secondary magnetizations. The highest stability component is the characteristic remanent magnetization (ChRM) that is removed during the later steps of demagnetization, and it may or may not be the primary magnetization. Demagnetization techniques are capable of determining the directional information associated with ChRM, but cannot determine not whether it is a primary remanence. Consequently, a test for primary remanence must be applied. Common tests for primary remanence include fold tests and conglomerate tests; a more detailed description of a fold test will be discussed in this chapter.

Paleomagnetic analysis begins with the measurement of the NRM of each specimen using a 2G cryogenic superconducting magnetometer (Figure 2.3). The cryogenic magnetometer, located in Memorial Hall at the University of Windsor, is a superconducting magnetometer that uses liquid helium and Superconducting Quantum Interference Devices (SQUIDs). It is capable of obtaining very accurate, sensitive NRM measurements down to 10^{-6} A/m. Following each step of demagnetization, the specimens are measured in the cryogenic magnetometer and the range of step measurements then allows for the identification of distinct directional components that contribute to the NRM. All paleomagnetic analysis, including demagnetization, are carried out in a shielded magnetic-field-free room in order to prevent the acquisition of secondary magnetization due to the present-day magnetic field.

2.4.2 Demagnetization techniques

The two standard demagnetization techniques are alternating field demagnetization (AF) and thermal demagnetization. These techniques attempt to isolate the ChRM of the specimens, ideally revealing primary directional information acquired at the time of rock formation.

Fig.2.3. 2G Cryogenic magnetometer in the paleomagnetic laboratory at the University of Windsor.

2.4.2.1 – Alternating-field demagnetization

Once placed inside the alternating field demagnetizer, such as the Sapphire Instruments SI-4 illustrated in Figure 2.4, the specimen is exposed to a decaying alternating field, which removes low stability components and ideally reveals ChRM (Butler 1992; Finn and Coe 2016). Specimens undergo AF demagnetization in a stepwise fashion, with increasing field directions. For example, after initial NRM measurements of the specimen is recorded, it is exposed to a field with a magnitude of 5 milli Teslas (mT). The magnetic domains with a coercive force less than or equal to 5 mT will align in one direction. The specimen is then exposed to an opposite field direction of slightly less than 5 mT and the magnetic domains with a coercive force less than or equal to that applied field will align in the opposite direction. As the field further decays, the domains are aligned in one of two opposing directions, and their magnetizations will collectively cancel out. Thus the net contribution of grains with coercive forces less than the maximum alternating field are removed, and the domains with coercive forces greater than or equal to the maximum alternating field remain (Butler 1992). This method of demagnetization is most useful when working with multi-domain magnetite grains (Butler 1992).

2.4.2.2 – Thermal demagnetization

Specimens that are not susceptible to AF demagnetization are deemed coercively hard, and in these cases, another method of demagnetization must be used, such as thermal demagnetization. A maximum of 52 specimens are loaded into a thermal demagnetizer, like the Magnetic Measurements MMTD1 demagnetizer (Figure 2.5), and they are exposed to increasingly high temperatures, stepwise in an oven. Between each temperature step, remanent magnetization is measured using the cryogenic magnetometer. The specimens are progressively heated to

Fig.2.4. Sapphire Instruments SI-4 alternating field demagnetizer at the University of Windsor (bottom two shelves) with cryogenic SQUID controllers for X,Y,Z axes on upper shelves.

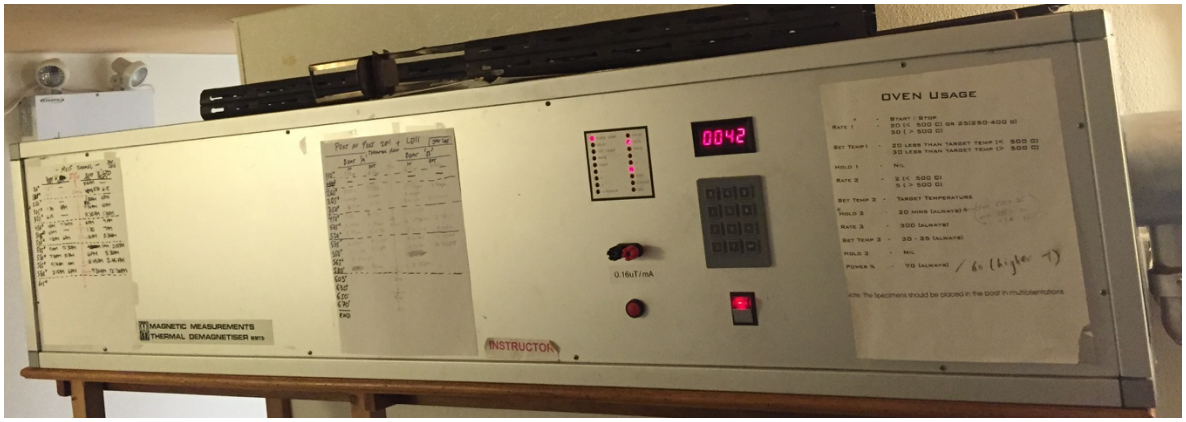

Fig.2.5. Magnetic Measurements MMTD1 demagnetizer at the University of Windsor.

temperatures below the Curie temperature of particular magnetic minerals. The Curie temperature is the temperature at which permanent magnetic properties are lost and can be replaced with induced magnetization (i.e. 580ºC for magnetite) (Butler 1992). Prior to measurement, the specimens cool down to room temperature. This allows for all magnetic domains with a blocking temperature less than or equal to the particular temperature step to retain a thermoremanent magnetization (TRM) of zero at room temperature, as the processes is carried out in a magnetic-field-free space. This essentially erases the low stability components carried by those domains, revealing higher unblocking temperature components and ideally, primary magnetizations.

2.5 Fold test

In order to determine whether or not the directional information can be considered primary, deformational constraints must be taken into account. If the magnetic signatures illustrated by the specimens show directions that consistently have the same inclination to bedding, as illustrated in Figure 2.6, then it can be said that remanence was acquired prior to deformation. In the case of post-folding remanence acquisition, the directions would all have different inclinations relative to bedding, but similar inclinations *in situ* with respect to the fold structure and so the deformation event likely occurred prior to magnetization, suggesting that it must be a secondary remanence (Figure 2.7). A positive fold test, where the data points converge after tilt correction, would suggest that the remanence was acquired before deformation and may be primary (Figure 2.8). A negative fold test, where the data points diverge after tilt correction, would suggest that the remanence was acquired after deformation and is a secondary remanence (Figure 2.9).

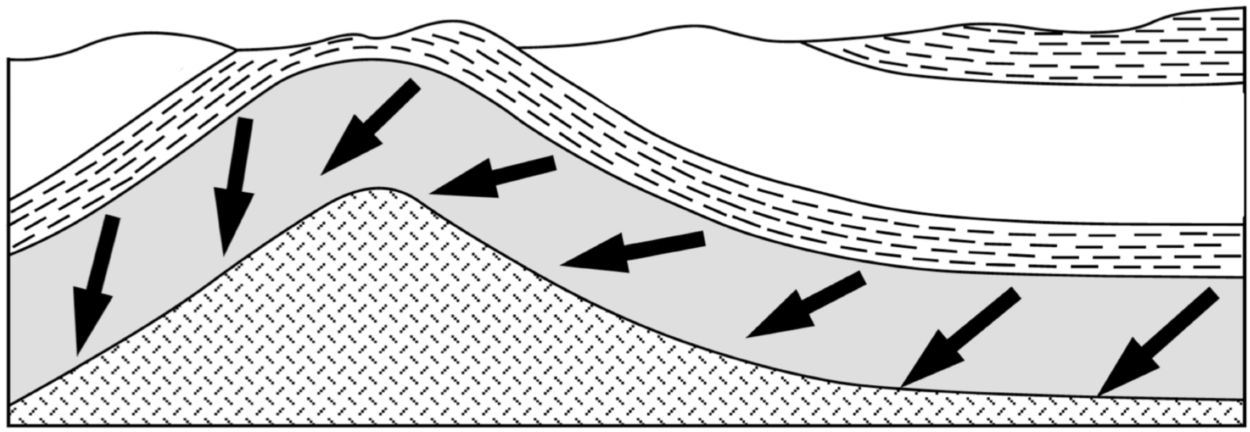

Fig.2.6. Pre-folding remanent magnetization (adapted from Butler 1992).

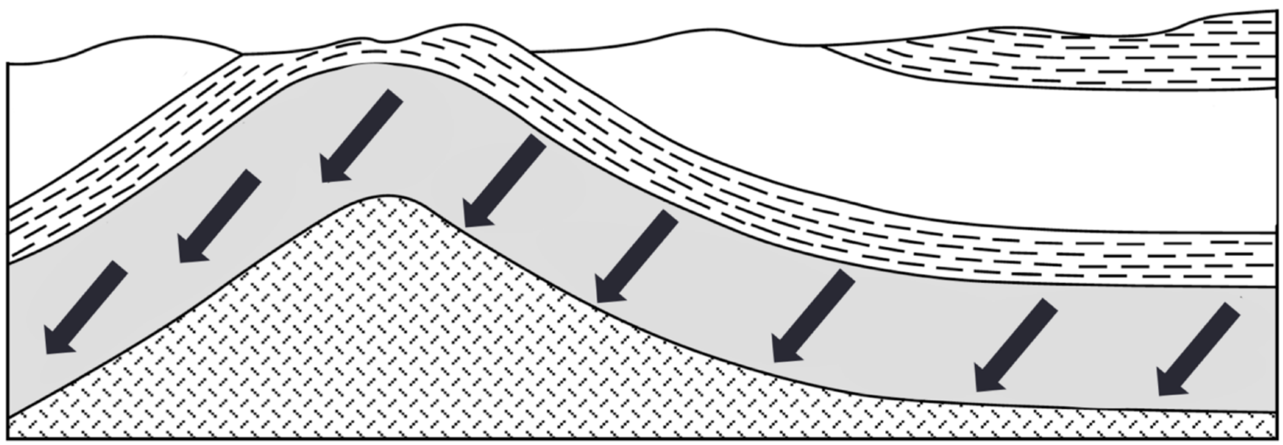

Fig.2.7. Post-folding remanent magnetization (adapted from Butler 1992).

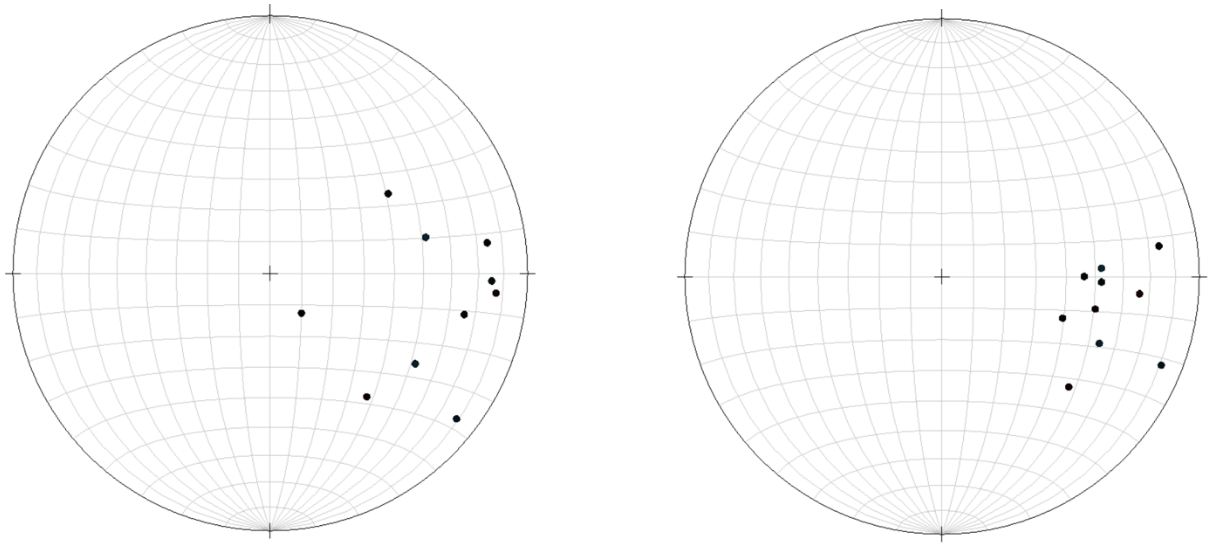

Fig.2.8. Converging data points following tilt-correction, demonstrating a positive fold test.

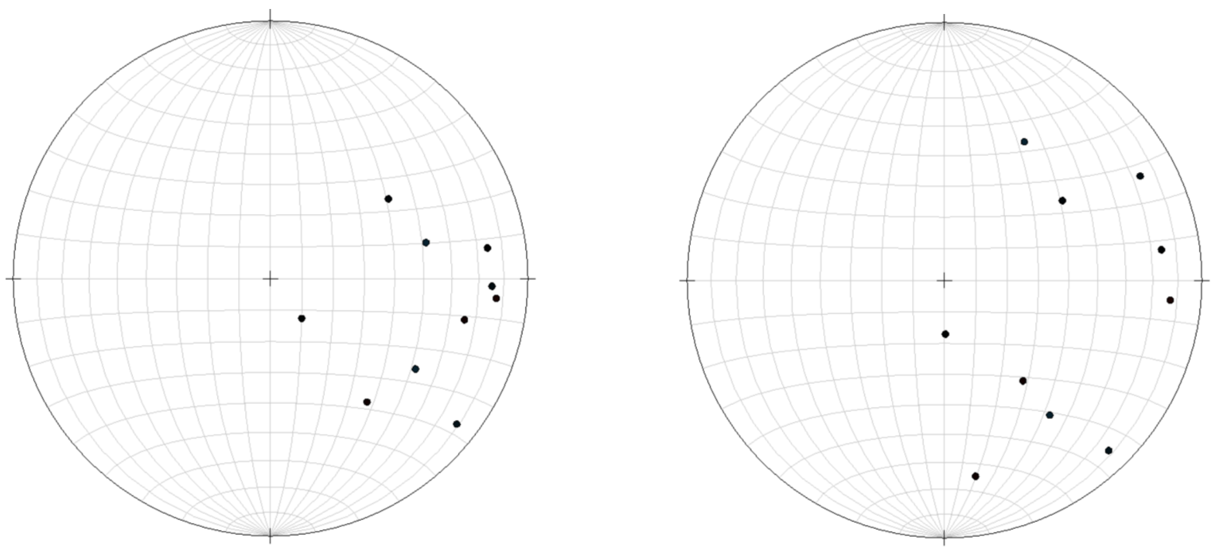

Fig.2.9. Diverging data points following tilt-correction, demonstrating a negative fold test.

2.6 Simplified overview of uranium-lead (U-Pb) geochronology

U-Pb geochronology is one of the most advanced and recognized methods of radiometric dating. It has been advantageous in a variety of areas of geoscience and has been crucial in providing time constraints for processes concerning the formation of the solar system, rates of tectonothermal processes and paleogeographic reconstructions (Schoene 2014). This dating technique can be used to provide age dates for rocks that formed ranging from as young as 1 Ma to as old as 4 Ga.

The radioactive decay of ^{238}U and ^{235}U produce two of the four stable isotopes of Pb (^{206}Pb and ^{207}Pb). Each of the parent isotopes has a different half life; the decay of ^{238}U to ^{206}Pb has a half life of 4.47 Ga and the decay of ^{235}U to ^{207}Pb has a half life of 0.704 Ga (Dickin 2005; Faure and Mensing 2005). Minerals such as allanite, apatite, baddeleyite, monazite, perovskite, rutile, titanite, xenotime and zircon are used, with zircon being the most common (Hanchar and Hoskin, 2003). The presence of Pb in a zircon grain can be assumed to have originated from radioactive decay since the mineral strongly rejects Pb from its crystal system but readily incorporates U. Therefore, the Pb/U ratio can be used to determine the age of the zircon mineral.

A concordia diagram, and subsequent concordia curve (Wetherill 1956), is used to compare the ages provided by the different decay rates U (Figure 2.10). If the $^{206}Pb/^{238}U$ and $^{207}Pb/^{235}U$ ratios in the mineral grain plot on the concordia curve, it can be inferred that the position on the plot delineates the age of the mineral. Conversely, if the $^{206}Pb/^{238}U$ and $^{207}Pb/^{235}U$ ratios in the grain do not fall on the concordia curve, the ages are discordant and do not agree with one another. If a grain plots on the concordia curve, it is assumed that the mineral crystallizes from the original magma and remained in a closed system, with little or no gain of U and little or no loss of Pb (Schoene 2014).

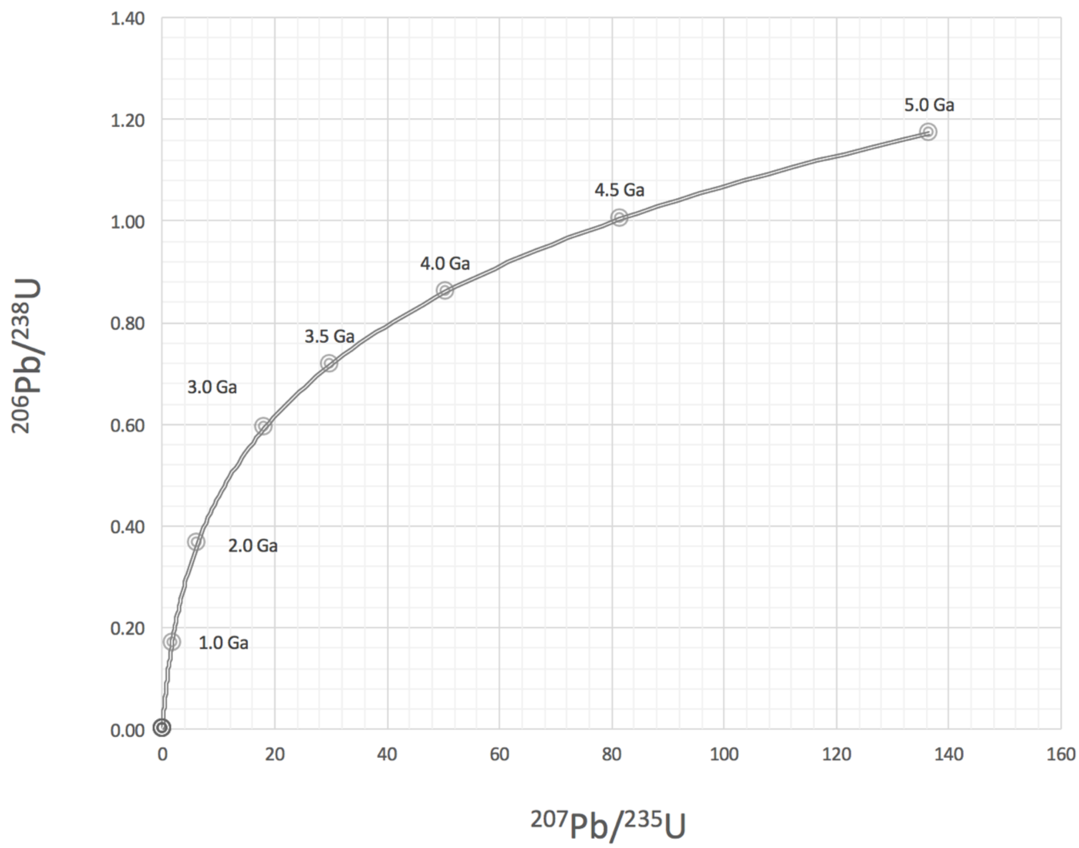

Fig.2.10. Concordia curve (Wetherill 1956) in which the ratios of $^{206}Pb/^{238}U$ and $^{207}Pb/^{235}U$ are plotted against each other. A concordant age date will result in a position along the curve, while a discordant age will not.

2.7 References

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CHAPTER 3 – Paleomagnetic reassessment of the Early Paleozoic carbonate rocks of the Port au Port Peninsula, Newfoundland, Canada

Abstract: The Cambrian Port au Port Group, along with the Ordovician St. George and Table Head Groups, are exposed in the Port au Port Peninsula, NL, and are associated with the passive margin phase of the Laurentian margin. Paleomagnetic assessment of the limestone and dolostone specimens aimed to stepwise demagnetize the natural magnetic remanence (NRM) to reveal ancient magnetic field directions. Several previous paleomagnetic studies from the Port au Port Peninsula reported results for the overlying Early Ordovician St. George and Table Head Groups, finding both primary magnetizations and overprints likely acquired during the Alleghenian and Taconic orogenies. Paleomagnetic results of the Port au Port Group have revealed similar findings as previous studies on the Peninsula. The group was sampled in 25 sites, with an additional site for the underlying Labrador Group. The 26 sites produced 496 specimens, with 21 of those sites producing interpretable results. Demagnetization of the specimens revealed very weak magnetizations that were resolvable as three recognizable magnetic components: *V*, *I* and *M*. The *V* component is interpreted to be a Viscous Remanent Magnetization (VRM) typically removed by 20 mT, showing a steep down and north direction that is similar to the present-day field direction. The *I* component unblocked over an intermediate temperature range up to 450° C, with a shallow down or up and southeast direction. The *M* component was defined over a higher temperature range up to 580° C, in which magnetite unblocked and a shallow down, southeastern direction was also removed. Demagnetization of St. George and Table Head Groups also revealed a *V* component, while the Table Head Group revealed an additional *I* component. The secondary remanence magnetizations revealed by the *I* and *M* components of these specimens were likely acquired during orogenic activity, recording the Kiaman reverse polarity magnetic field direction.

3.1. Introduction

Nearly all of the paleogeography that is known for the Paleozoic Era is based on paleomagnetic data to some extent, giving distance and direction to the pole for certain localities. The analysis of magnetic minerals in rocks has been widely used in paleogeographic reconstructions, as information regarding the paleolatitude of the regions containing the rocks can be determined. During the time of its formation, rocks containing magnetic minerals can record the ambient Earth's magnetic field at that locality (Butler 1992). These magnetic recorders can then be used to determine the location of the Earth's poles, the field intensity and the position of the equator for that time period (Jin et al. 2013), providing vital information for paleogeographic reconstructions, allowing for interpretations of the continents' motions throughout time. However, some of the motions of the continents and terranes are not well understood for certain time periods due to gaps in the paleomagnetic record (see Figure 1.1).

A combination of paleomagnetic data, a fossil record with tropical fauna and pervasive carbonate deposits indicate that the paleogeographical position of Laurentia during the Early Paleozoic Era would have been securely on the equator. Laurentia was a very stable land mass, with very minimal movement during this time; therefore, reconstructions were modelled around its stationary position. The global paleogeography during the Cambrian is thought to have resembled the reconstruction illustrated in Figure 1.3, with Laurentia straddling the equator and Gondwana stretching from the South Pole well into the Northern Hemisphere (Torsvik and Cocks 2013).

The formation of the Port au Port Group is interpreted to have been related to the stable passive-margin phase of Laurentia, following the breakup of Rodinia. During the time of formation, the magnetic minerals (i.e. goethite, magnetite) within the carbonates would have recorded the ambient Earth's magnetic field at that locality. Paleomagnetic analysis of these magnetic markers has the potential to determine the location of the Earth's poles, the field intensity and the position of the equator for that time period (Jin et al. 2013), providing vital information on the paleoposition of the craton. Furthermore, it is possible that overprint field directions were also recorded by the same magnetic minerals following deposition. Ancient, non-primary remanence may have been acquired during or after deformation and may provide insight on the paleoenvironment during or following the accretion of exotic terranes onto Laurentia. The purpose of this study is to report primary remanence in the Port au Port Group and to reassess paleomagnetic results for the overlying St. George and Table Head groups. This will be done by exposing the limestone and dolostone specimens to demagnetization techniques, which aims to remove secondary magnetic remanence and reveal ancient directions. This will, in turn, strengthen existing global paleogeographic reconstructions for the Early Paleozoic.

3.2. Geological setting

The geological history of the Port au Port Peninsula is quite complex, as the region was has undergone several episodes of Paleozoic subaerial exposure and karsting (Knight and James 1987; Williams et al. 1996). The Paleozoic stratigraphy of the Port au Port Peninsula is representative of continental Laurentia and is well-documented, with strata categorized into several groups based on the different physical processes under which they formed, as well as their particular tectonic histories (Williams et al. 1996). During the Late Precambrian, the Laurentian continent that represents ancestral North America underwent a rifting event, eventually forming an oceanic basin (Cocks and Torsvik 2011). The short-lived Iapetus Ocean, a precursor to the Atlantic Ocean, would fill this basin during the Early Paleozoic era (Cawood et al. 2001).

Continental rifting was caused by crustal extension, which led to the first stages of the formation of the Paleozoic continental margin. The Port au Port Group illustrates a major change from clastic to carbonate-dominated deposition during the transition from rift to passive margin phase (Knight et al. 1995). Figure 3.1 shows the Paleozoic stratigraphy of the entire Port au Port Peninsula. Sedimentation in the Cambrian to the Lower Ordovician occurred on a rigid lithosphere and formed autochthonous strata in relatively shallow, near-shore conditions. This includes the underlying Labrador Group, the Port au Port Group and the overlying St. George, Table Head and Goose Tickle groups. James et al. (1983) interpreted the entire carbonate package to have represented the foundation of an extensive carbonate platform, which currently lies below the modern-day Gulf of St. Lawrence. The sediments deposited during the Middle to Late Cambrian that made up the Port au Port Group consisted of carbonates and minor siliciclastics. It consists of a 500 m unit of silty and sandy carbonates, deposited during the Middle to Late Cambrian period, and contains some of the oldest exposed rocks on the peninsula. (Knight et al. 1995). The group display one of two deposition patterns: 1. Thin beds of silty limestone and dolostone and shale and 2. Thick beds of oolitic limestone and laminated dolostone (Levesque 1977). The shallow marine carbonates of the Port au Port Group overlie the sandstone-dominated Hawke Bay Formation and can be divided into three formations: March Point, Petit Jardin and Berry Head (Chow 1985; Prasad 1986). Chow (1985) describes the basal March Point Formation as predominately comprised of mudstone and dolostones that has weathered to a grey-tan colour, with minor shale, grainstone and sandstone beds. The overlying Petit Jardin Formation can be further subdivided into five members: Cape Ann, Campbells, Big Cove, Felix, and Man O’War. The stratigraphy of Petit Jardin is much more complex when compared to the other formations within the group and some members cannot be correlated in areas other than the peninsula (Chow 1985). The Berry

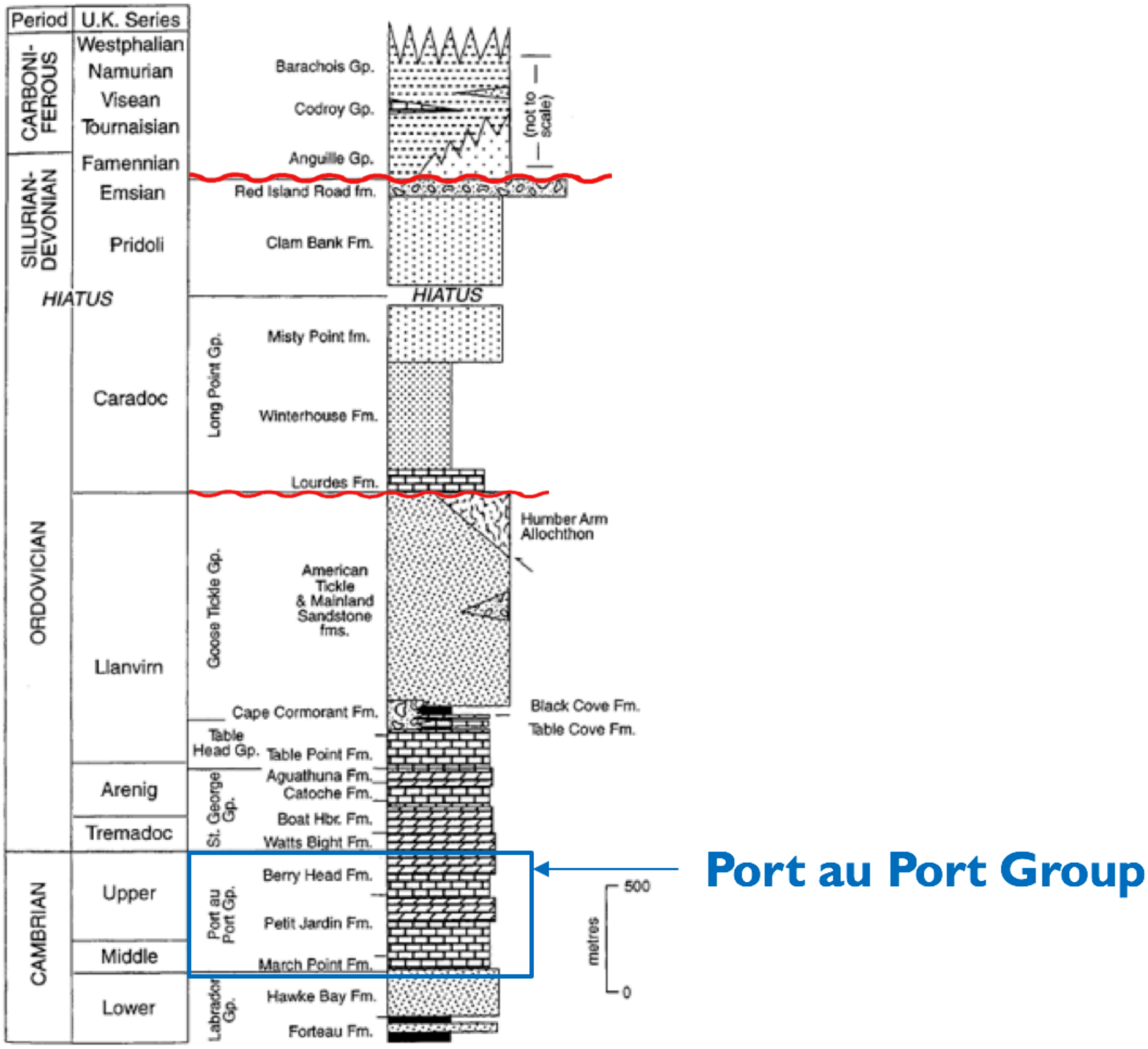

Fig.3.1. Stratigraphic column of the Port au Port Peninsula in the Early Paleozoic (adapted from Williams et al. 1996).

Head Formation is described as laterally extensive sequence of laminated dolostones, interbedded dolomitized oolites and stromatolites.

The sediments that comprise the Early Ordovician St. George Group were deposited under low energy, sub-tidal conditions. The 500 m thick group can be subdivided into four formations: Watts Bight, Boat Harbour, Catoche, and Aguathuna, all dominated by limestones and dolostones (Figure 3.2) (Prasad 1986; Knight and James 1987; Williams et al. 1996). Knight and James (1987) reported variable dolomitization amongst the formations, related to subaerial karsting. The initial stages of the Taconic orogeny commenced during deposition of the oldest Aguathuna Formation (Prasad 1986). The Table Head Group conformably lies over the carbonates of the St. George Group (Figure 3.3), and formed during the submergence and breakup of the outer continental margin, as deposition is interpreted to be related to the first stages of the closure of the Iapetus Ocean (Prasad 1986).

Following and during deposition of the Early Paleozoic carbonates on the peninsula, the region experienced deformation that may have affected the magnetic nature of the rocks. There were three main mountain building events that are observed in the geological record of Laurentia and they were the Taconic, Acadian and Alleghenian orogenies. The first occurred during the Ordovician, as the Iapetus began to close and an island arc eventually collided with and accreted onto Laurentia, resulting in the formation of the mountain range that stretched from present-day Atlantic Canada to New England. The Taconic orogeny subsided in the Late Ordovician, as subduction ceased. The region remained tectonically-quiet until the Late Devonian when the next period of mountain-building began, resulting in the Acadian orogenic belt. The Acadian orogeny was a result of continent-continent collision; the land mass of the combined terranes Baltica and Avalonia subducted below the eastern Laurentian margin, which resulted in the closure of the

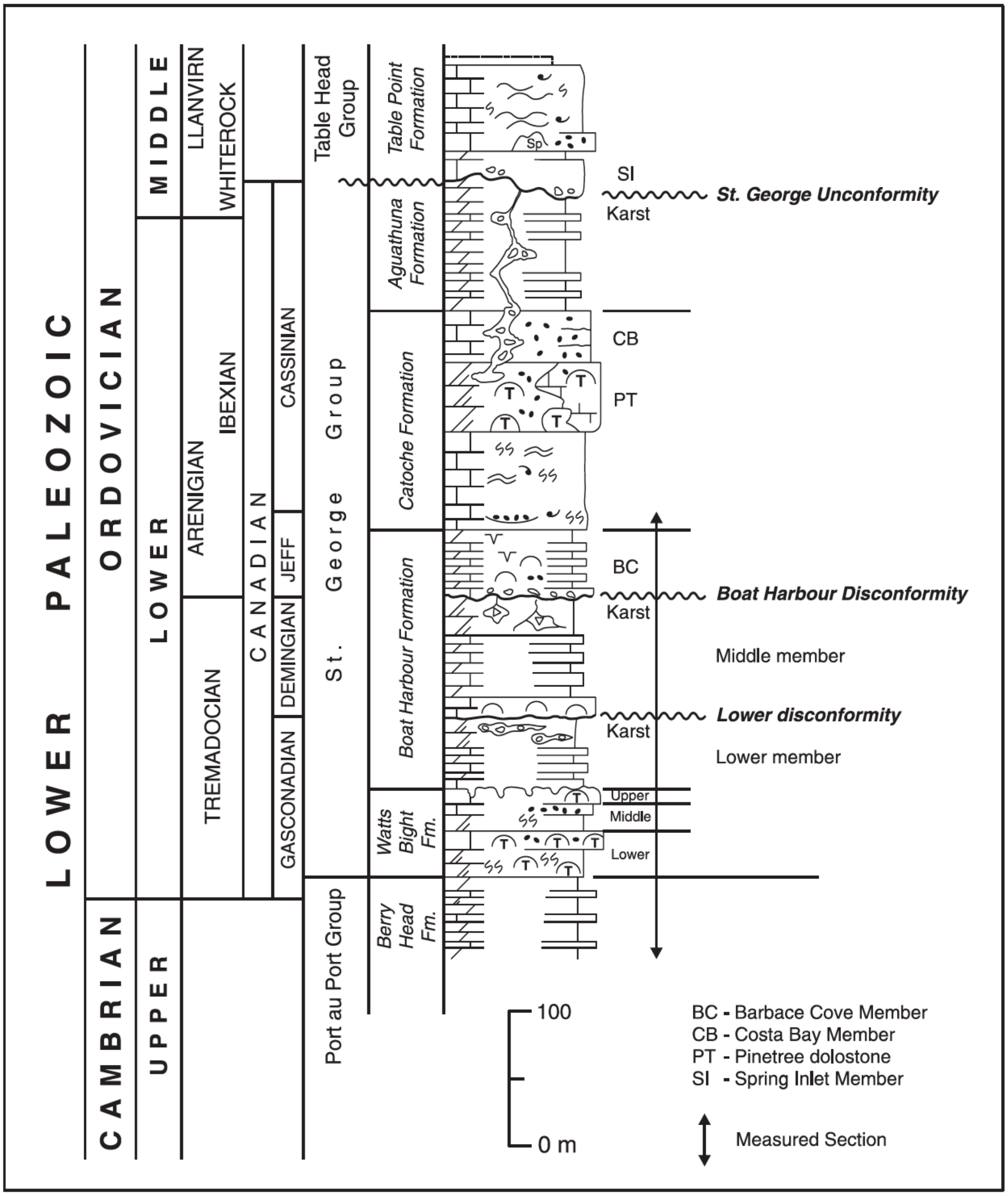

Fig.3.2. Stratigraphic column of the Early Ordovician St. George Group (Knight et al. 2008).

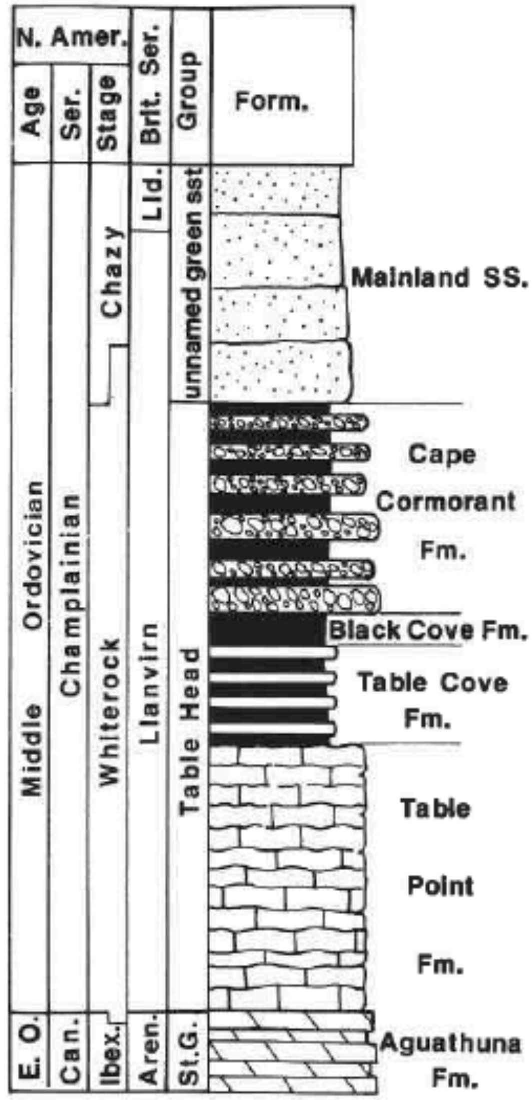

Fig.3.3. Simplified stratigraphic column of the Middle Ordovician Table Head Group (Stenzel, Knight and James 1990).

southern Iapetus ocean. Lastly, the Alleghenian orogeny was a result of Gondwana colliding with Laurentia during the formation of supercontinent Pangaea. These mountain building events may have been responsible for the remagnetization of rocks, specifically limestones and dolostones, as the migration of fluids can alter the magnetic signature.

3.3. Methodology

176 oriented block samples from 25 sites were collected for paleomagnetic assessment of the Port au Port Group, with an additional site sampled for the underlying Hawke Bay Formation of the Labrador Group (site 18). All three formations within the Port au Port Group were sampled in three localities along the coast of the peninsula (Figure 3.4), with each formation producing between one and seventeen sites. Each site produced five-to-eleven samples, and following preparation in the Western Paleomagnetic and Petrophysical laboratory, a total of 496 specimens were weighed and measured for magnetic susceptibility before demagnetization techniques were applied. All measurements of magnetic remanence, including initial natural remanence magnetization measurements, were made by using the cryogenic magnetometer at the University of Windsor; while mass and magnetic susceptibility measurements were made at the University of Western Ontario.

At least one specimen from each block sample was subjected to stepwise demagnetization through a combination of alternating field (AF) demagnetization and thermal demagnetization. The remanence direction and intensity after each demagnetization step was measured and recorded (Appendix A). The specimens were no longer useful in terms of providing directional information when the sample intensity dropped below instrument noise level or when the sample displayed erratic behavior. For a detailed explanation of the demagnetization techniques, refer to Chapter 2.

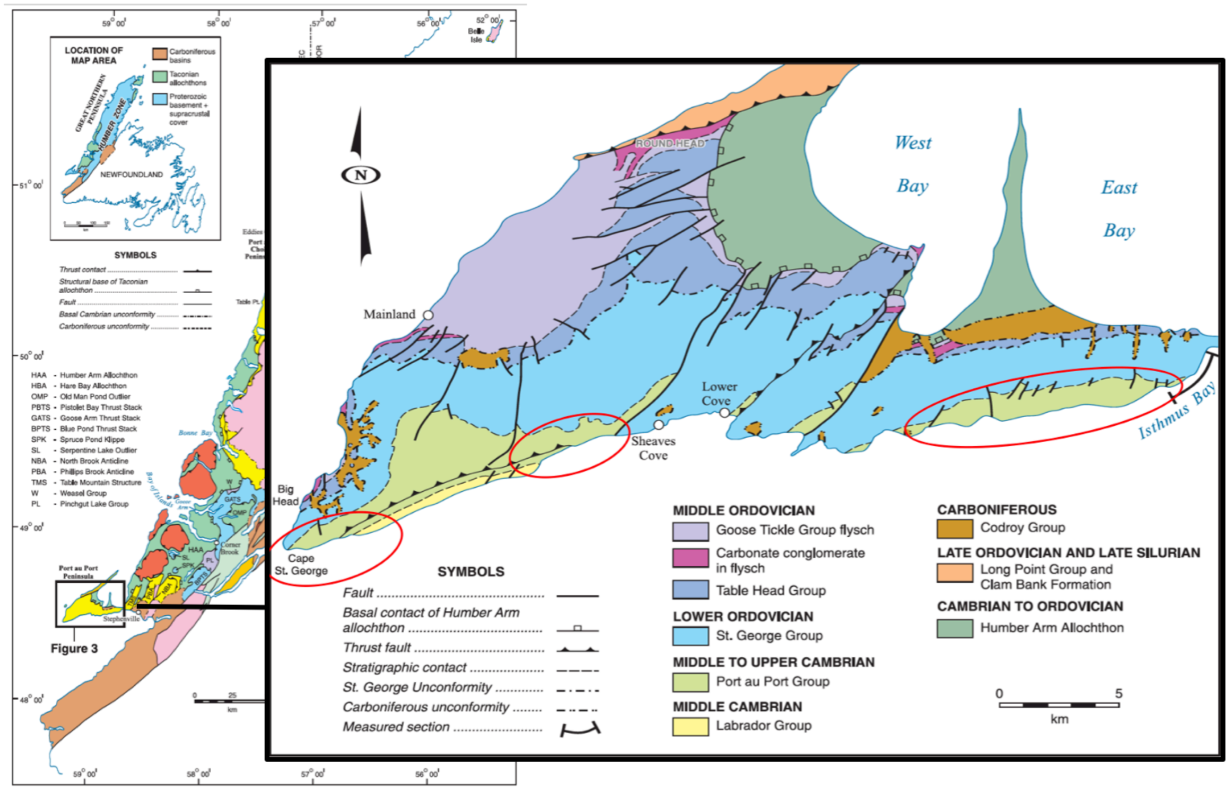

Fig.3.4. Sampling localities (enclosed by ovals) for the Port au Port Group (adapted from Knight et al. 2008).

The overlying St. George and Table Head Groups were also sampled using the standards mentioned above, with the groups producing a total of ten sites and 102 specimens (Figure 3.5).

3.4. Results

Magnetic components were defined using Interactive Analysis of Palaeomagnetic Data (IAPD) software at the University of Western Ontario. Paleomagnetic pole calculations were also made using IAPD software, with the assumption of a geocentric axial dipole field and a constant radius of the Earth throughout geological history.

3.4.1 Demagnetization results for the Cambrian Port au Port Group

Of the 26 sites, 21 produced interpretable results, despite the weakly magnetized nature of the samples. Typical demagnetization behaviour throughout the collection is illustrated by the remanence decay and orthogonal plots in Figures 3.6 and 3.7. The plots illustrate the directional information for the same specimen (120701). Demagnetization revealed magnetizations that are resolvable as three magnetic components: *V*, *I* and *M*. The *V* component, highlighted in red, is interpreted to be a Viscous Remanent Magnetization, typically removed by 20 mT and showing a direction similar to the present-day field direction. Any leftover magnetization was coercively hard and was removed via thermal demagnetization. The *I* component unblocked over an intermediate temperature range between 260ºC to 450° C, displaying a shallow down or up and southeasterly direction. The *M* component was defined over a higher temperature range up to 580° C, in which magnetite unblocked and a shallow down, southeasterly direction was also removed.

Sites 5, 15, 17, 19, 22, were unable to provide any useable directional information, as components could not be resolved (Table 3.1). 14 of the 21 cooperative sites were able to display the *V* component, interpreted to be the overprinting of the present-day magnetic field. The *I* component was confidently displayed in all cooperative sites, in which magnetization was

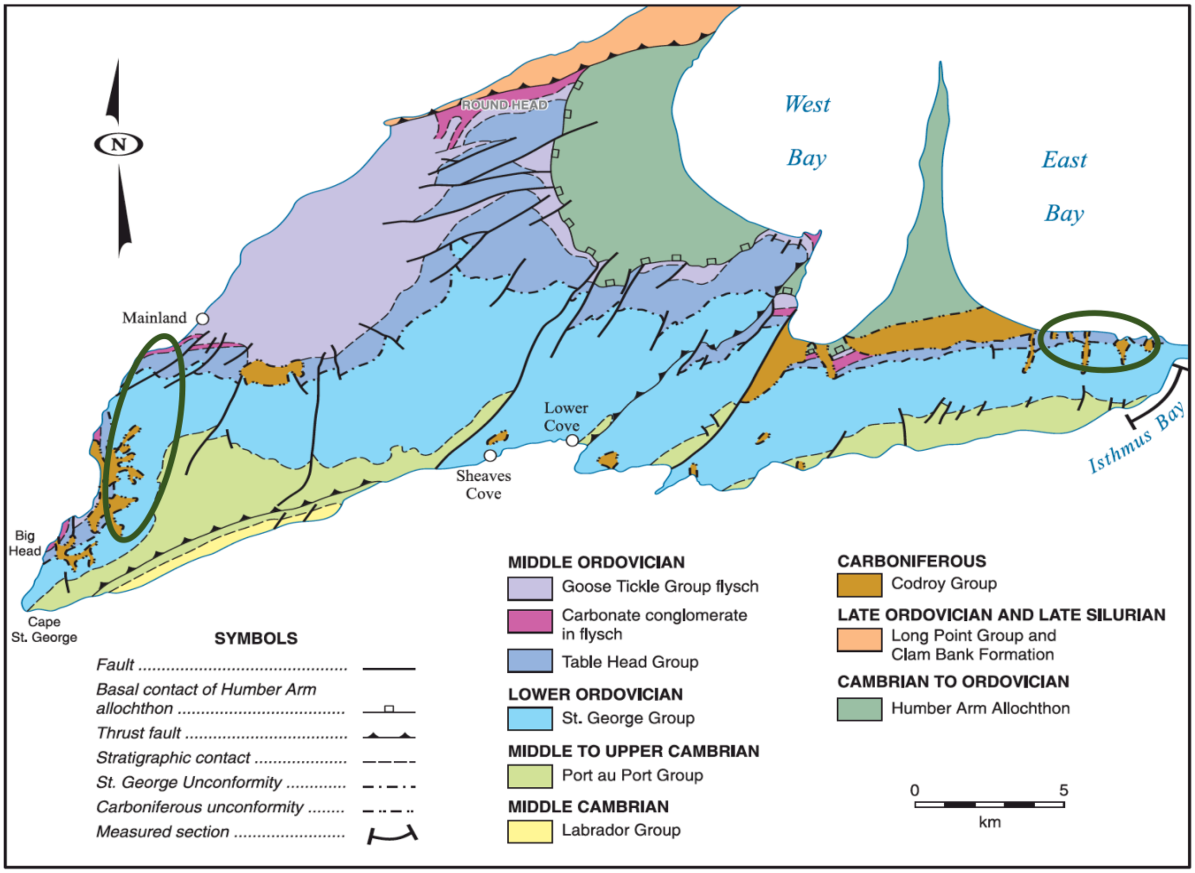

Fig.3.5. Sampling localities (enclosed by ovals) for the St. George and Table Head Groups (adapted from Knight et al. 2008).

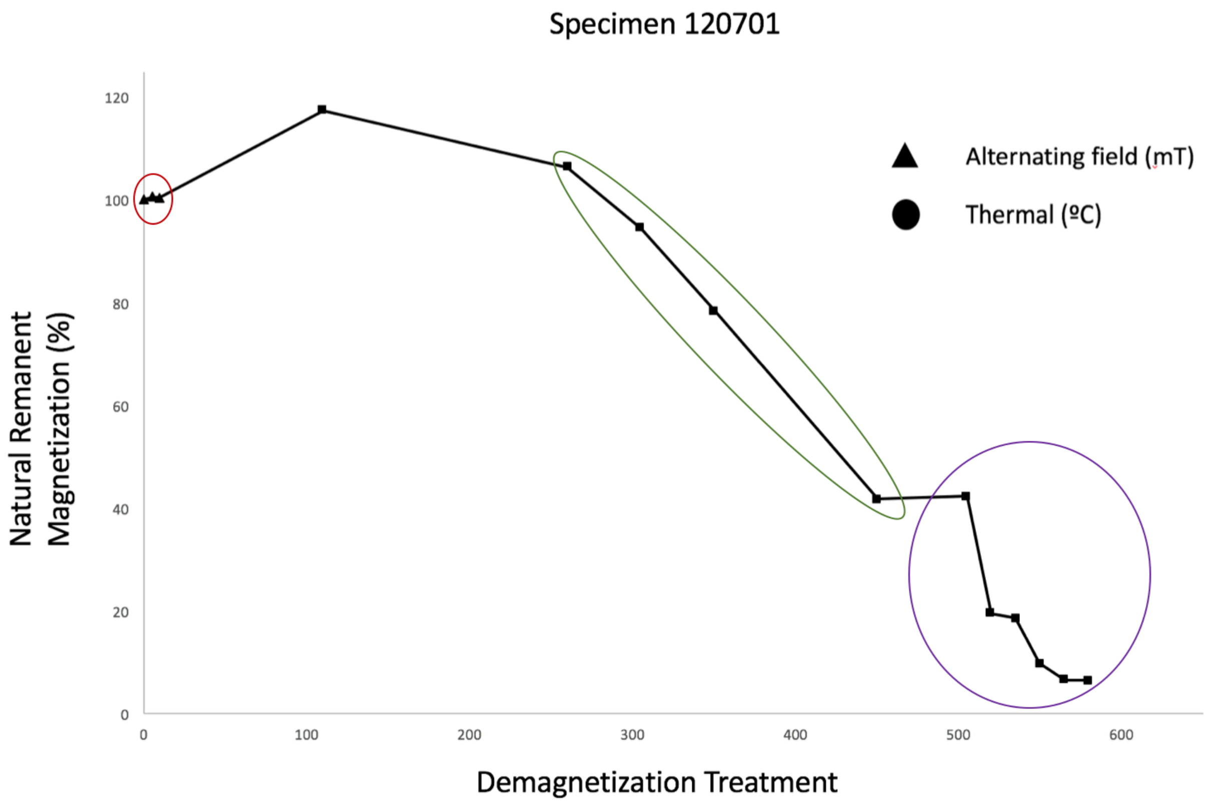

Fig.3.6. Remanence decay plot for specimen 120701 of the Port au Port Group displaying a V component (red), I component (green) and M component (purple). The x axis illustrates the demagnetization steps, while the y axis illustrates the percentage of remanence remaining after demagnetization.

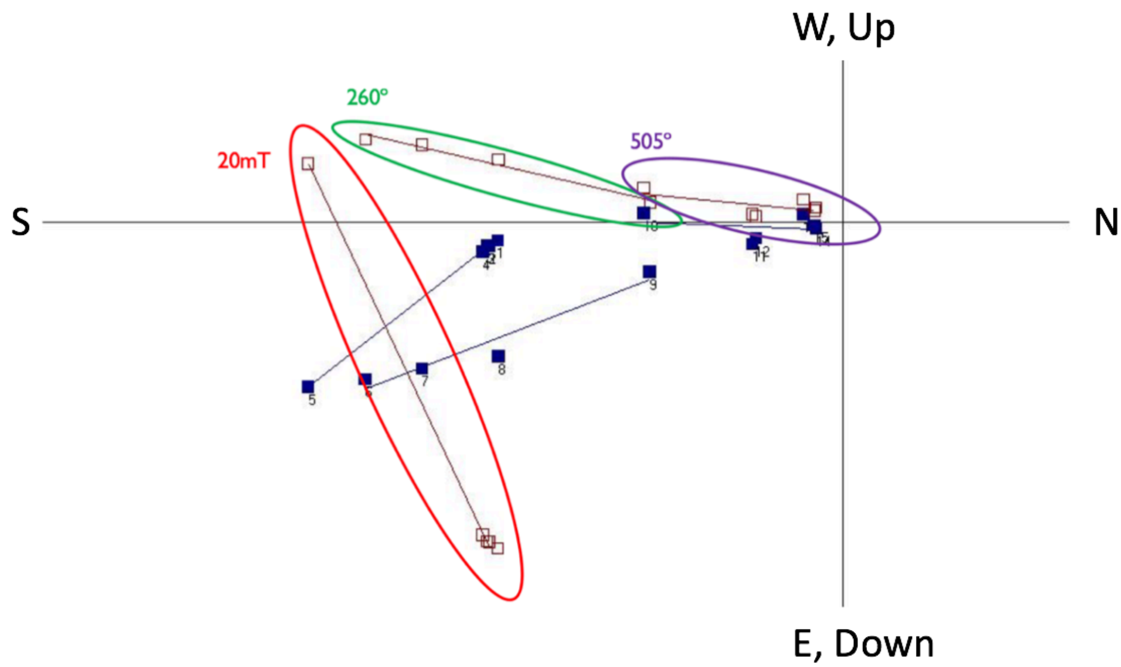

Fig.3.7. Orthogonal vector plot for specimen 120701 of the Port au Port Group displaying the directional information for the V component (red), I component (green) and M component (purple). The origin of the plot represents 'zero'; the three-dimensional demagnetization is projected into the horizontal plane (closed symbols) and the vertical N-S plane (open symbols).

Site	V component	I component	M component
01	350°, 38°	162, -19°	168°, -9°
02	383°, 54°	180°, -11°	170°, -22°
03	360°, 68°	150°, -23°	N/A
04	348°, 34°	160°, -22°	N/A
05	N/A	N/A	N/A
06	338°, 57°	154°, 39°	207°, -12°
07	333°, 57°	161°, 7°	163°, 33°
08	356°, 74°	118°, -38°	135°, -34°
09	340°, 60°	227°, -32°	N/A
10	356°, 77°	200°, 54°	114°, 35°
11	319°, 75°	121°, -5°	N/A
12	335°, 65°	155°, -4°	207°, 26°
13	326°, 54°	179°, -14°	N/A
14	341°, 73°	154°, 14°	138°, 3°
15	N/A	N/A	N/A
16	7°, 17°	191°, 53°	N/A
17	N/A	N/A	N/A
18	N/A	144°, 6°	147°, 12°
19	N/A	N/A	N/A
20	N/A	155°, -10°	N/A
21	N/A	152°, 0°	N/A
22	N/A	N/A	N/A
23	N/A	170°, 2°	N/A
24	N/A	170°, -14°	N/A
25	N/A	166°, -7°	N/A
26	N/A	158°, -1°	N/A

Table 3.1. Summary of paleomagnetic results on site-by-site basis for the Port au Port Group, Port au Port Peninsula, western Newfoundland (48.5833ºN, 59.0000ºW).

coercively hard, but removed during thermal demagnetization between 260ºC to 450° C. Unblocking of the *I* component revealed a shallow down or up and southeasterly direction. Nine sites displayed the *M* component, in which magnetization was also coercively hard but removed after the 580ºC step during thermal demagnetization. The unblocking of magnetite revealed a shallow down, southeastern direction, similar to the *I* component.

The data were analyzed in-situ and bedding tilt corrections were applied, allowing a fold test to be conducted. The fold test was inconclusive and it cannot be concluded whether the remanence was acquired before or after deformation. The calculated paleomagnetic direction found in the carbonates of the Port au Port Group is 161º, 4º. The calculated paleopole based on the Port au Port paleomagnetic directions was determined to be 40ºS, 331ºE (Figure 3.8). The pole is most closely related to the mid Carboniferous portion of the apparent polar wander path (APWP) for Laurentia (Torsvik et al., 2012), falling approximately 30º to the east. The corresponding paleolatitude calculated is approximately 10º, placing the craton near the equator at the time of remanence acquisition in the Carboniferous.

3.4.2 Demagnetization results for the Ordovician St. George and Table Head Groups

The magnetic components revealed after 20 mT and intermediate temperature steps were comparable to the components displayed by the Port au Port specimens (Table 3.2). The *V* component, found in both St. George and Table Head specimens, showed a direction similar to the present-day magnetic field, while the *I* component, found in only select Table Head specimens, showed a southeast and shallow direction (Figure 3.9).

Representative demagnetization behaviour of the collection is illustrated by Figure 3.10**,** in which the large majority of the specimens displayed erratic behaviour and did not contribute in resolving the two components. Many specimens were uncooperative and therefore the resultant

Site	V component	I component
SG01	352°, 66°	N/A
SG02	355°, 67°	N/A
SG03	351°, 68°	N/A
SG04	342°, 56°	N/A
TH01	350º, 69º	157º, 19º
TH02	N/A	N/A
TH03	329°, 67°	168°, 47°
TH04	N/A	160°, 10°
TH05	9°, 27°	150°, 17°
TH06	N/A	160°, 15°

Table 3.2. Summary of paleomagnetic results on site-by-site basis for the St. George and Table Head Groups, Port au Port Peninsula, western Newfoundland (48.5833ºN, 59.0000ºW).

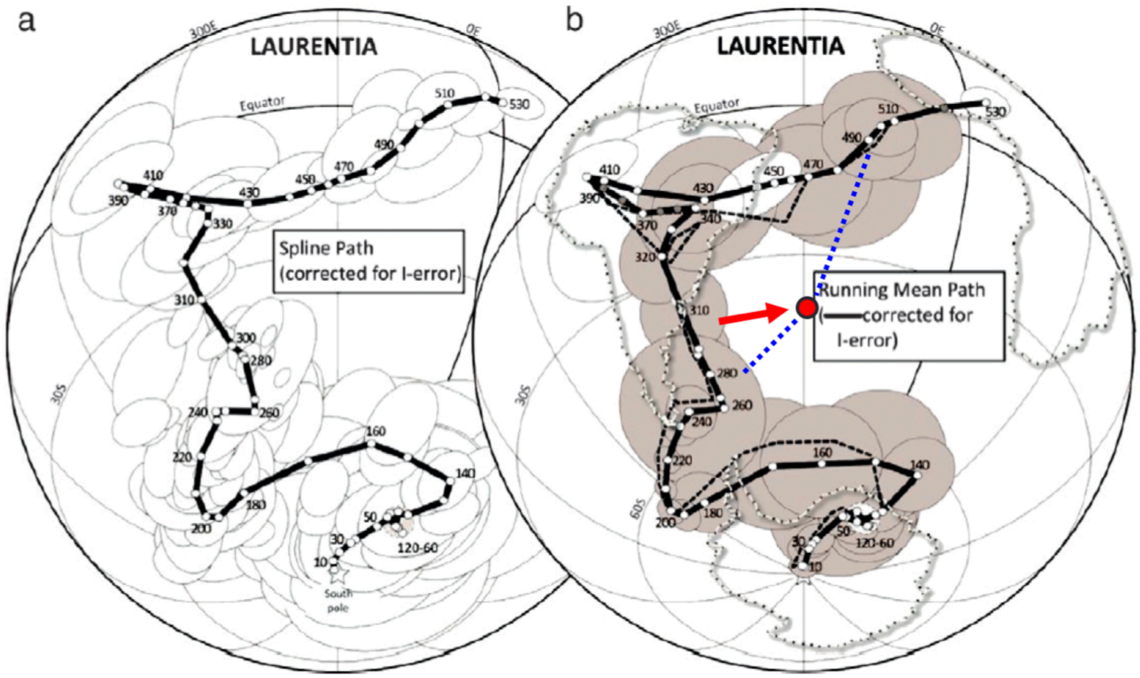

Fig.3.8. Calculated paleopole based on Port au Port paleomagnetic directions, D=161º, I=4º (Torsvik et al. 2012).

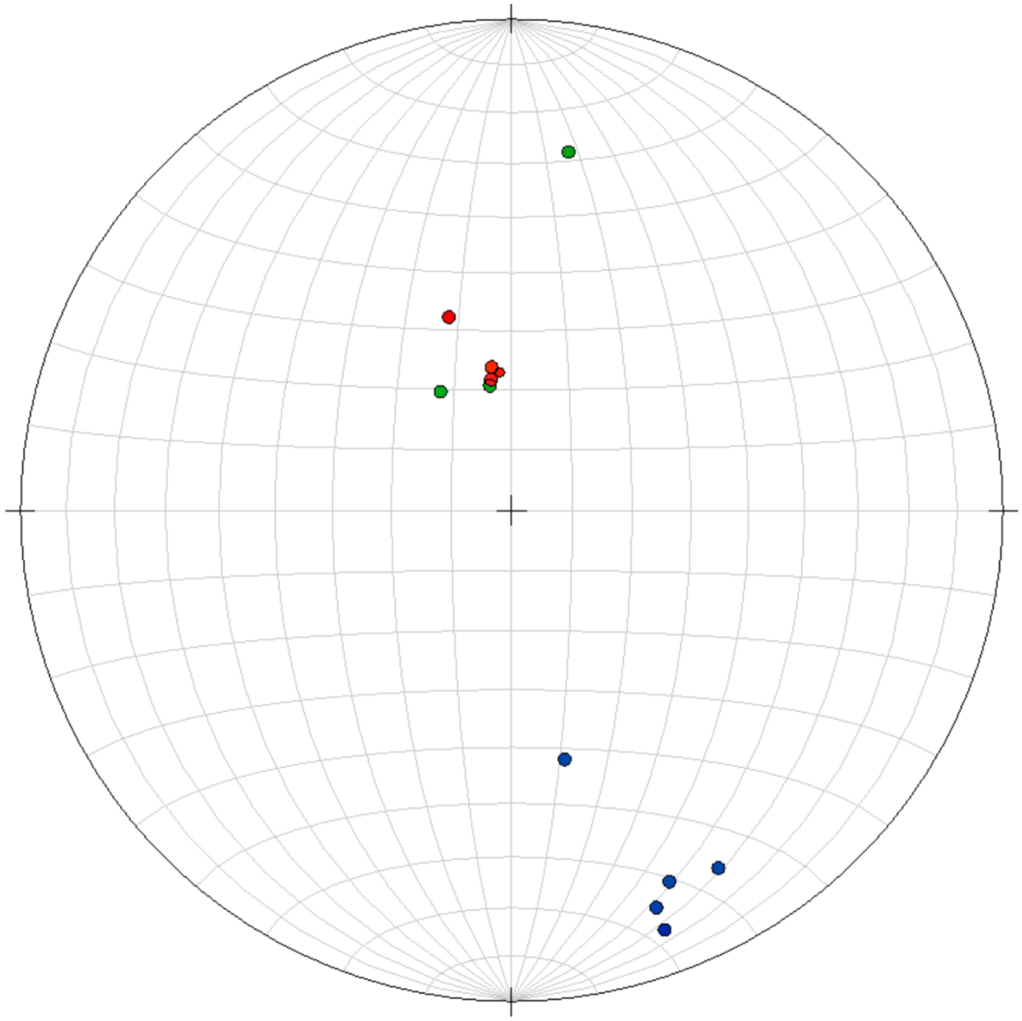

Fig.3.9. Equal-area plots of remanent magnetization directions for the V component for the St. George Group (red), V component for the Table Head Group (green) and the I component for the Table Head Group (blue) (drawn from Table 3.2).

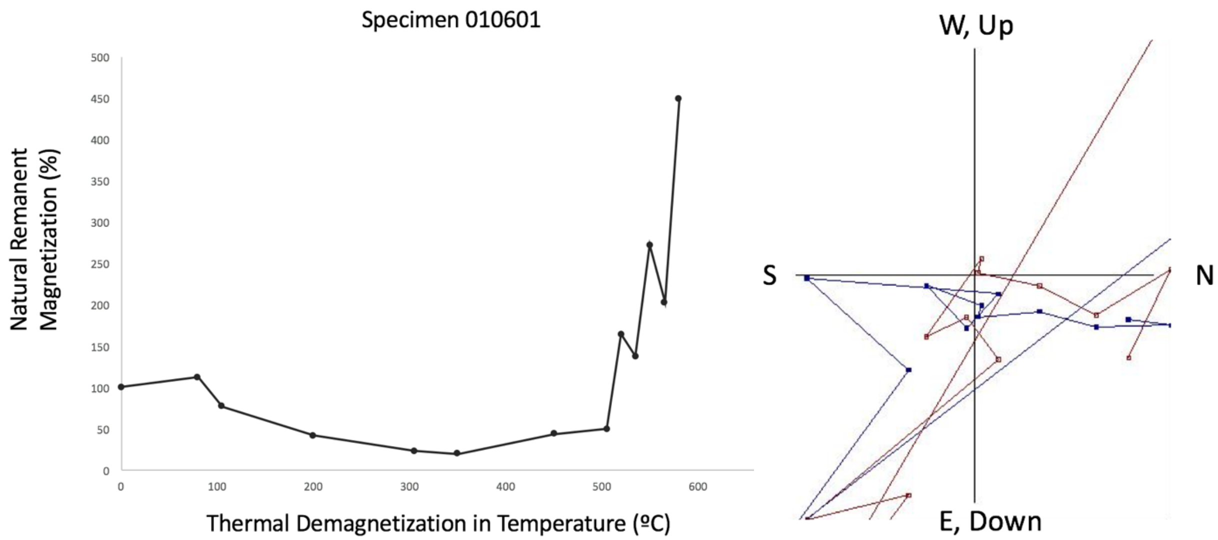

Fig.3.10. Representative demagnetization behaviour of the St. George and Table Head Groups illustrated by remanence decay and orthogonal plots (specimen 010601 of Table Head).

directional information was unusable. 88% of the St. George specimens and 45% of the Table Head Group exhibited magnetic intensities comparable to instrument noise level by the 505ºC step of thermal demagnetization, and were therefore unable to produce reliable results. Unlike the Port au Port Group, there was not a third, resolvable component unblocked after 580ºC.

3.5. Discussion

3.5.1 Port au Port Group

Paleomagnetic analysis indicates that the Cambrian Port au Port specimens were unable to deliver primary remanence on the basis of an inconclusive fold test and directional information that resembles a significant Carboniferous overprint event. However, the specimens were capable of delivering ancient remanence that was acquired during deformation. The overprint direction revealed by the specimens after AF and thermal demagnetization was 161º, 4º, likely acquired through orogenic processes related to the formation of the Alleghenian mountain belt during the Carboniferous.

The removal of VRM by 20 mT validates the assumption of correct sample orientation throughout the collection, preparation and analysis processes, as the *V* component closely matched up with the present-day magnetic field. The steep-down and northerly direction was recorded recently in geological history by the carbonates as a secondary remanent magnetization.

The *I* and *M* components displayed similar directional information, revealing approximately southeast and shallow directions, with varying inclinations. The likeness between the two components implies that the secondary remanence may have been acquired during the event. It may also imply that the components are not significantly different from one another, and the *I* component reflects the unblocking of multi-domain magnetite below 580ºC.

Despite an inconclusive fold test, the directional data is interpreted to be the result of secondary remanence acquisition, closely resembling a significant event in the paleomagnetic record. The *I* and *M* components are comparable to directions from the Kiaman (Permo-Carboniferous) reverse polarity superchron (Figure 3.11). The Kiaman lasted from 317 to 265 Ma (Opdyke et al. 2000; Menning et al. 2006; Musgrave and Fussell 2011), and was the longest interval of single polarity in the paleomagnetic record (Musgrave and Fussell 2011). Orogenic fluids associated with the Alleghenian mountain building event in the Carboniferous may have caused the growth of magnetite during diagenesis, recognized as chemical remanence magnetization (CRM) (Hodych 1989; Butler 1992). This mechanism would have resulted in a remanence acquisition at the time of the orogeny, with the newly formed magnetite grain recording a Kiaman Carboniferous magnetic field direction.

The calculated paleopole based on this shallow and south-southeasterly direction (40ºS, 331ºE) does not directly match the APWP for Laurentia, falling 30º longitude to the east (Torsvik et al. 2012). However, this overprint is comparable to those found in several studies (Deutsch and Prasad 1987; Hodych 1989; Warsame et al. 2017).

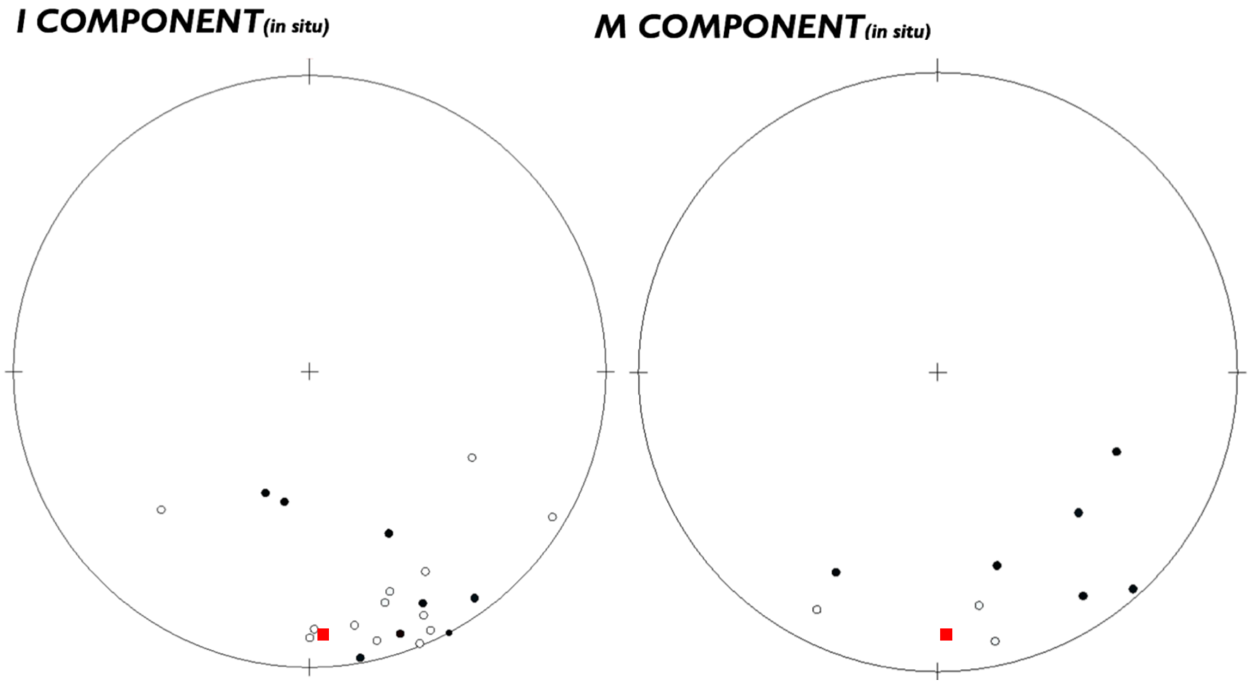

Fig.3.11. Equal-area plots of site mean directions for I and M components (drawn from Table 3.1) of the Port au Port Group compared to the expected calculated mean direction (D=178.5º, I=9.9º, α95=11) for the Kiaman Superchron overprint (red square) (310 Ma) at Port au Port based on 310 Ma mean paleopole (36.4ºS, 302.9ºE, α95=8) from the global APWP of Torsvik et al. 2012. Open circles represent up directions, while closed circles represent down directions.

3.5.2 St. George and Table Head Groups

Despite the lack of resolving an *M* component for the two Ordovician-aged groups, the *V* and *I* components were comparable to specimens from the Port au Port study. The St. George specimens were not capable of preserving any ancient remanence, including overprint directions, with only VRM removed. The group has been subjected to various intensities of dolomitization, which has been reported to affect the magnetic properties of carbonates. Shogenova (1999) reported changes in magnetic susceptibility in Ordovician dolomites of present-day Estonia, in which iron substitutes for magnesium in the crystal lattice. This suggests that the dolostone samples of the St. George Group were poor magnetic carriers and were too heavily altered to record magnetic fields other than that of the present-day. The Table Head Group was capable of preserving some ancient remanence, in addition to VRM, which was carried by magnetite (Hodych 1989). Although the unblocking temperature of magnetite is 580ºC, previous studies have interpreted the unblocking at lower temperatures to also be magnetite (Deutsch and Prasad 1987; Hodych 1989). The remanence carrier in this study, along with the aforementioned previous investigations may be multi-domain magnetite, resulting in the resolution of the *I* component at intermediate temperature steps of thermal demagnetization. The ancient direction revealed by the Table Head specimens are also interpreted to be a CRM, acquired during the Alleghenian orogeny. Furthermore, the sampling sites for the Table Head Group are located in the west end of the Port au Port Peninsula, where Carboniferous age karsting is known to have been more intense and a likely reason for remagnetization (Williams et al. 1996; Knight et al. 2008).

3.6. Conclusions

The south-southeast and shallow direction displayed by the specimens from the Cambrian Port au Port Group, as well as the Ordovician Table Head Group, place the Laurentian continent at low latitude during remanence acquisition in the Carboniferous period. The secondary remanence was likely acquired during orogenic activity, recording the Kiaman reverse polarity magnetic field direction. The paleomagnetic results reported support the need for further paleomagnetic investigation regarding the land masses that once bordered the Iapetus Ocean during the Paleozoic, in order to resolve and refine the paleogeographic reconstructions with primary information.

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CHAPTER 4 – Age and paleomagnetic assessment of the Silurian Mavillette gabbro, Meguma terrane, Nova Scotia, Canada

Abstract: The Mavillette gabbro is a plagioclase-rich gabbroic sill in southwestern Nova Scotia closely related to metavolcanic and metasedimentary rocks of the Silurian White Rock Formation. This rift-related magmatism was emplaced on and in turbiditic rocks of the Halifax Group, and likely marks the beginning of Meguma terrane drift towards Laurentia. The age of the gabbro has been determined to be 426 +/- 2 Ma (U-Pb baddeleyite), making it slightly younger than ca. 440 Ma bimodal volcanic rocks of the White Rock Formation. The Mavillette gabbro forms an arcuate body, folded about a regional southwest-plunging syncline of Neoacadian age (ca. 390 Ma). Paleomagnetic investigation of the gabbro aimed to stepwise demagnetize the natural magnetic remanence (NRM) to reveal ancient magnetic field directions. Previous paleomagnetic studies in the Meguma terrane have been unsuccessful due to pervasive metamorphism and deformation; as a result, little is known about the paleogeographic origin and drift history of the terrane. The sill was sampled in thirteen sites (223 specimens) exposed in two quarries, representing both east and west limbs of the syncline. Demagnetization of the specimens revealed magnetizations that are resolvable as two magnetic components: *V* and *M*. The *V* component is interpreted to be a Viscous Remanent Magnetization showing a scatter of directions between samples, implying that this remanence is unstable. The *M* component magnetization was coercively hard, but removed during thermal demagnetization in higher temperature steps, up to 580° C, in which magnetite unblocked and an ancient, south-southeast and shallow-down direction was removed. This ancient remanence is interpreted to represent a Carboniferous remagnetization event, related to the Alleghenian orogeny.

4.1. Introduction

The lack of viable paleomagnetic data for the Paleozoic Era, particularly for the Ordovician and Silurian time periods, has led to unreliable global paleogeographic reconstructions, as a result of errors associated with data interpolation. In global paleogeographic reconstructions for the Early Paleozoic, there are large uncertainties concerning the paleocontinents and terranes that are thought to have bordered the Iapetus Ocean (Cawood et al. 2001; Murphy et al. 2004; McCausland et al. 2007). Much of the paleomagnetic and tectonic record of supercontinental breakup and assembly is recorded in terranes (Cawood et al. 2001; Murphy et al. 2004; Pollock et al. 2012). The paleogeographic origin and drift history of the Meguma terrane is not well constrained, as previous paleomagnetic studies were unsuccessful due to pervasive metamorphism and deformation (Waldron et al. 2009). The original paleolatitude of the Mavillette gabbro at the time of emplacement might be determined through paleomagnetic techniques applied to magnetic-mineral-bearing rocks of lower metamorphic grade. Current accepted global paleogeographic reconstructions do not specify whether the terrane was at high (60ºS) or low (30ºS) latitude in the Early Silurian (Figure 4.1). Determining the position of Meguma for this time period would provide insight on the tectonic history of the terrane; a high latitude would imply rifting from Gondwana, while a low latitude would imply subduction related to the accretion onto Avalonia. Additionally, a non-primary overprint paleomagnetic direction acquired during or after a deformation event may provide information regarding the local tectonic and thermal history of the terrane during or following its accretion to Laurentia.

The formation of the intrusion is interpreted to have been rift-related, as it may have marked the beginning of Meguma terrane drift towards Laurentia (MacDonald et al. 2002). During the time of formation, the magnetic minerals (i.e. magnetite) within the gabbroic sill would have

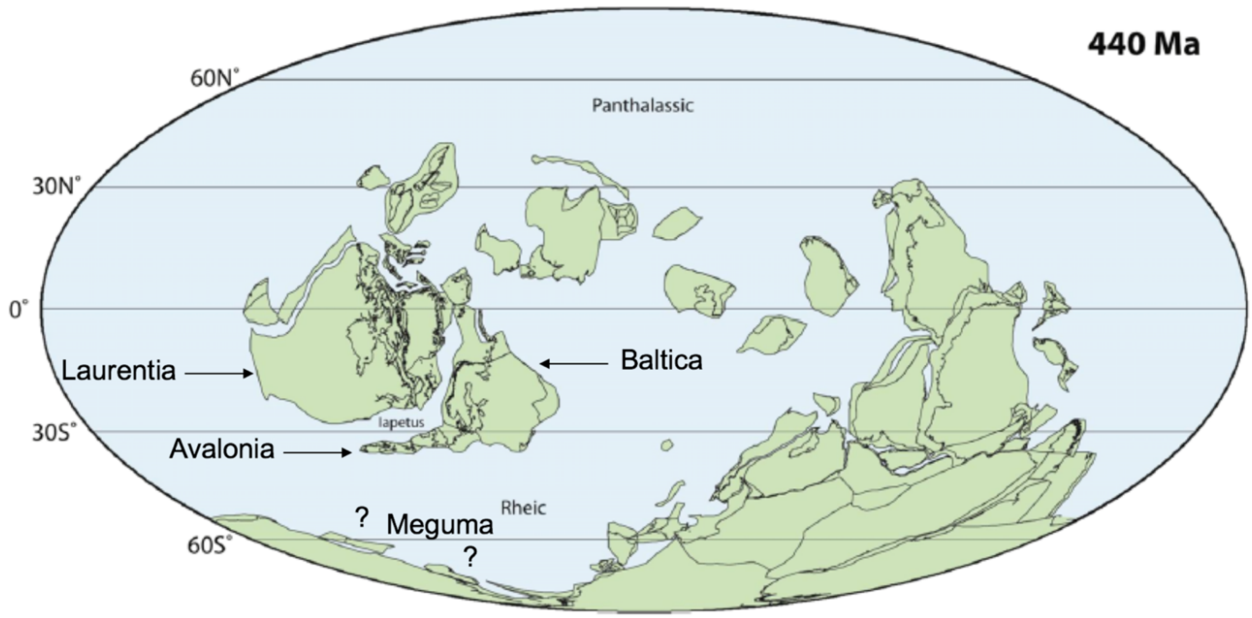

Fig.4.1. Global paleogeographic reconstruction for the Silurian period, in which the exact location of Meguma remains unknown (adapted from Torsvik and Cocks 2013).

recorded the ambient Earth's magnetic field at that locality. Paleomagnetic analysis of these magnetic markers has the potential to determine the location of the Earth's poles, the field intensity and the position of the equator for that time period (Jin et al. 2013), providing vital information on the paleoposition of the terrane. Furthermore, it is possible that overprint field directions, following the Mavillette gabbro becoming emplaced on and in turbiditic rocks of the Halifax Group, were also recorded by the same magnetic minerals. Ancient, non-primary remanence may have been acquired during or after deformation (i.e. Neoacadian folding, orogenic processes, etc.) and may provide insight on the paleoenvironment during or following the accretion of Meguma to Laurentia. This ancient remanence would likely be the result of: 1. Thermoremanent magnetization, acquired during cooling from high temperature or 2. Chemical remanent magnetization, formed by growth of ferromagnetic grains. The purpose of this study is to report the age of the intrusion, as well as provide viable paleomagnetic data for the Meguma terrane.

4.2. Geological Setting

The Mavillette gabbro in the Yarmouth area of southern Nova Scotia, Canada (Figure 4.2) is composed of predominantly plagioclase, augite and resultant alteration products. The gabbro forms an arcuate body, folded about a regional shallowly southwest-plunging syncline of Neoacadian age (Calder and Barr 1982; White et al. 2003). It has a sub-ophitic to ophitic texture with visible sulfide minerals and planar foliation defined in hand sample by plagioclase laths that appear to be a sill paleohorizontal indicator. The sill has experienced some metamorphism and alteration after it was emplaced on and in the turbiditic rocks of the Halifax Group, dominated by slate and metasiltstone (White et al. 2003; White 2010). The group is unconformably overlain by the Silurian White Rock Formation, which is most closely related to the intrusion (Keppie et al. 1997; MacDonald et al. 2002; White 2010).

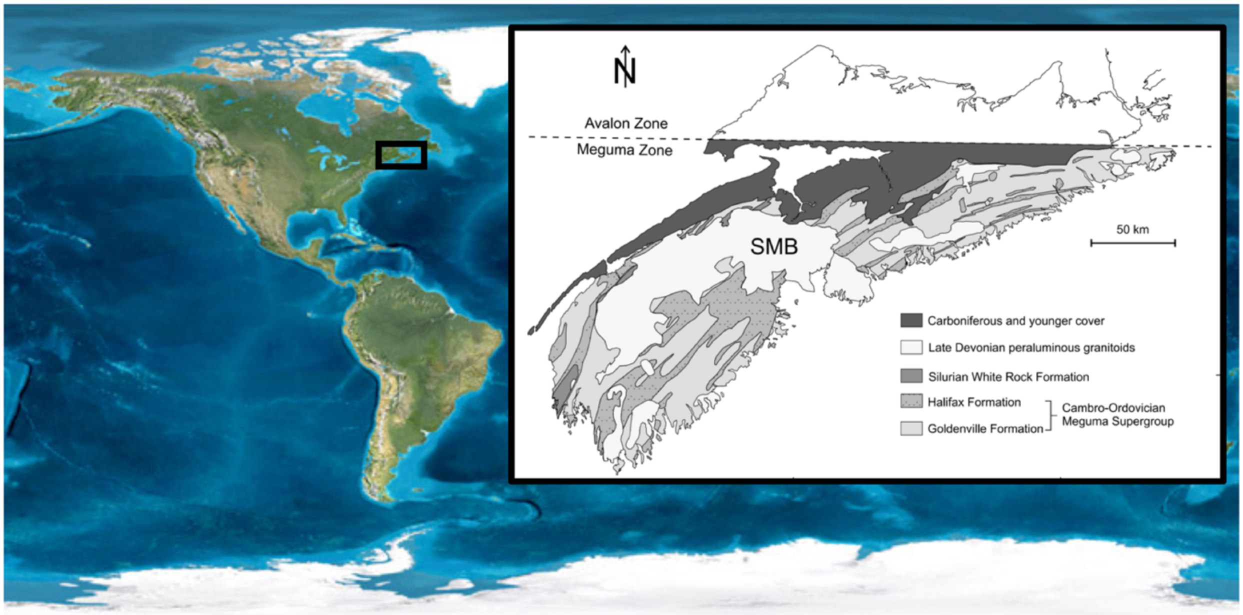

Fig.4.2. Present-day geographic location of the Meguma terrane (adapted from Clarke et al. 2004).

Deformation of the area can be observed in the Meguma terrane where the stratigraphic units (Meguma group and White Rock Formation) display northeast-trending folds (White et al. 2012). Analysis of ^{40}Ar-^{39}Ar data of muscovite has found that greenschist facies metamorphism and deformation occurred during the Early Devonian (ca. 415–395 Ma), after deposition of the Torbrook Formation, which conformably overlies the White Rock Formation (Keppie and Dallmeyer 1994; White 2012; White and Horne 2012; White et al. 2012).

4.3. Methodology

4.3.1 U-Pb geochronology

The sample collected for radiometric dating originated in site 2 from the eastern limb of the syncline. Baddeleyite grains that were relatively clear and lacked inclusions were grouped and analyzed by TIMS. The distillation process included washing the grains in distilled nitric acid, followed by double-distilled water. The grains were loaded into Krogh type TEFLON dissolution bombs along with a mixed $^{205}Pb/^{235}U$ tracer and approximately 15 drops of distilled hydrofluoric acid. The dissolution bombs were placed in an oven at 210ºC for a span of 5 days, in order for ion exchange to occur. The resultant purified uranium and lead were collected in a beaker with a single drop of ultrapure phosphoric acid. The products were combined with silica gel and dilute phosphoric acid before loaded onto outgassed single rhenium filaments in order to conduct mass spectrometry analysis.

For detailed information on how mass spectrometry was carried out, refer to the 2014 report 'Late Neoproterozoic epithermal alternation and mineralization in the western Avalon Zone: a summary of mineralogical investigations and new U/Pb geochronological results' by Sparkes and Dunning. For more information on U-Pb geochronology, refer to Chapter 2 of this thesis.

4.3.2 Paleomagnetic sampling and demagnetization

Samples representative of the Meguma terrane were collected from three localities in the Mavillette gabbro, where the intrusion is well-exposed, totaling thirteen sites (Figure 4.3). Seven sites were sampled from quarries in the east limb and six from the west limb of the synclinally-folded sill, to potentially enable a fold test for primary remanence at Mavillette. Drill core samples were collected using a gasoline-powered portable drill and oriented using an orientation stage and compass. All measurements of magnetic remanence, including initial NRM measurements, were made by using the 2G cryogenic magnetometer at the University of Windsor; while mass and magnetic susceptibility measurements were made at the University of Western Ontario.

Approximately one-third of the specimens were subjected to a liquid nitrogen treatment (Dunlop and Argyle, 1991) after alternating field (AF) demagnetization, prior to thermal demagnetization. This method of low temperature demagnetization is mainly used to suppress MD magnetite as a remanence carrier by removing any remaining VRM not removed by 20 mT. For a detailed explanation of the process, refer to the 1991 report by Dunlop and Argyle, 'Separating Multidomain and Single-Domain-Like Remanences in Pseudo-Single-Domain Magnetites (215–540 nm) by Low Temperature Demagnetization.'

The remaining specimens were that were suitable for demagnetization (i.e. intact and not taped) were exposed to stepwise demagnetization through a combination of AF demagnetization and thermal demagnetization. The specimens were no longer useful in terms of providing directional information when the sample intensity dropped below instrument noise level or when the sample displayed erratic behavior.

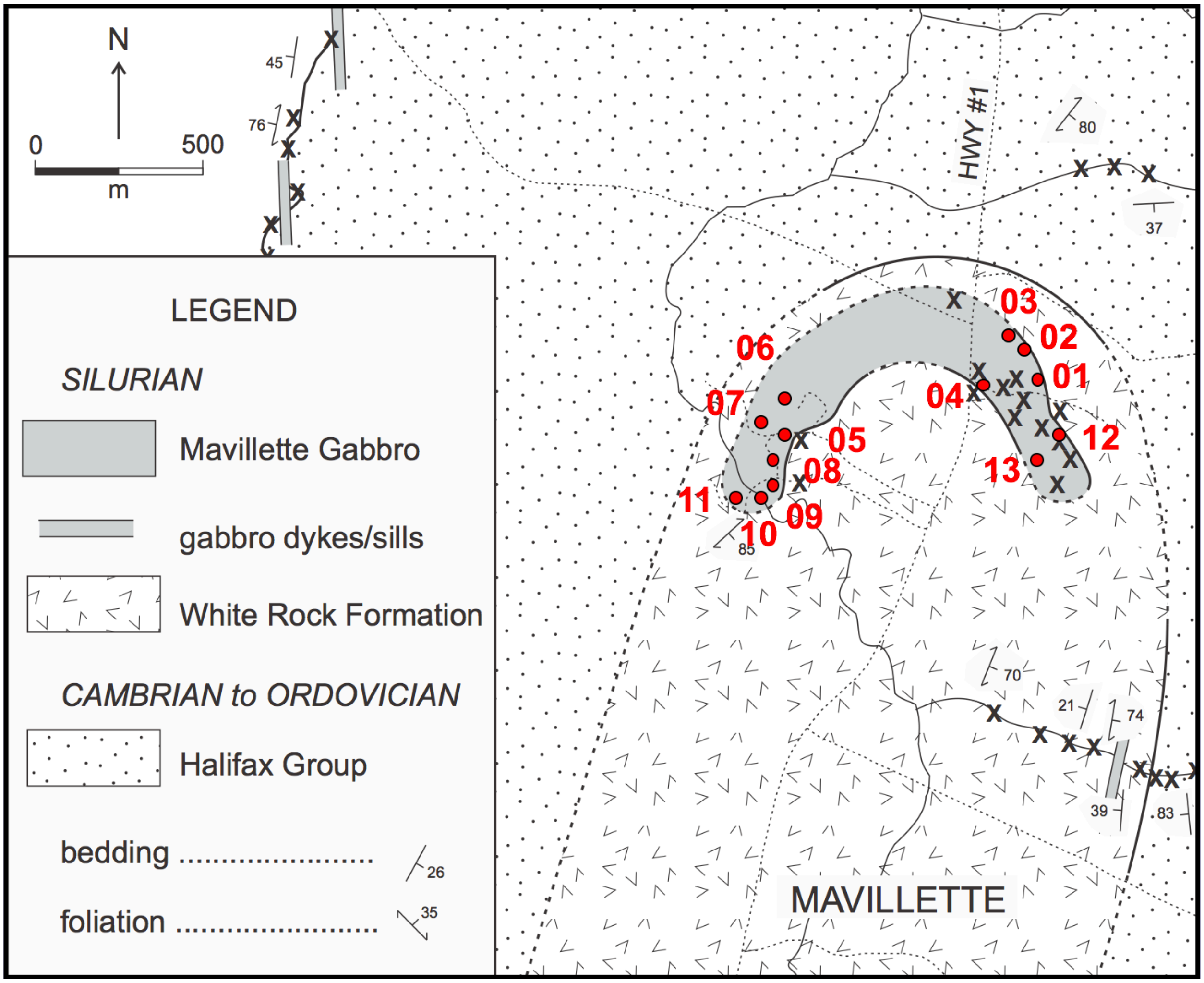

Fig.4.3. Paleomagnetic sampling sites, number from 1-13 (adapted from White et al. 2003 where ‘x’ represents geochemical sample locations).

4.4. Results

4.4.1 Radiometric dating of the Mavillette Intrusion

The application of uranium-lead geochronology through ID-TIMS (Isotope Dilution – Thermal Ionization Mass Spectrometry), including sample preparation and analysis, was conducted at Memorial University, by Dr. Gregory R. Dunning.

Three fractions of 2 to 5 baddeleyite grains were run and found to be concordant. The fractions overlapped and yielded a weighted average of $^{206}Pb/^{238}U$ age of 426 +/- 2 Ma (Figure 4.4), making the gabbro slightly younger than the ca. 440 ma bimodal volcanic rocks of the White Rock Formation (MacDonald et al. 2002). The age was not complicated by Pb-loss or ancient Pb inheritance, and confidently represents the crystallization age of the Mavillette gabbro.

4.4.2 Demagnetization results

Magnetic components were defined by least square best-fit lines (Kirschvink 1980) on a series of at least four demagnetization steps over which significant remanence was lost, with a maximum angular deviation of the best fit line of <15 degrees being deemed acceptable. This was done using Interactive Analysis of Palaeomagnetic Data (IAPD) software at the University of Western Ontario. Paleomagnetic pole calculations were also made using IAPD software, with the assumption of a geocentric axial dipole field and a constant radius of the Earth throughout geological history (Butler 1992).

Typical demagnetization behaviour throughout the collection is illustrated by the remanence decay plots in Figure 4.5. Of the thirteen sites, eight produced interpretable results due to the prevalence of multi-domain (MD) magnetite within the samples. Sixty-one per cent of the pilot specimens demonstrated MD magnetite-dominated behaviour, with less than 12% NRM intensity remaining by 20 mT. Demagnetization of the specimens revealed magnetizations that are

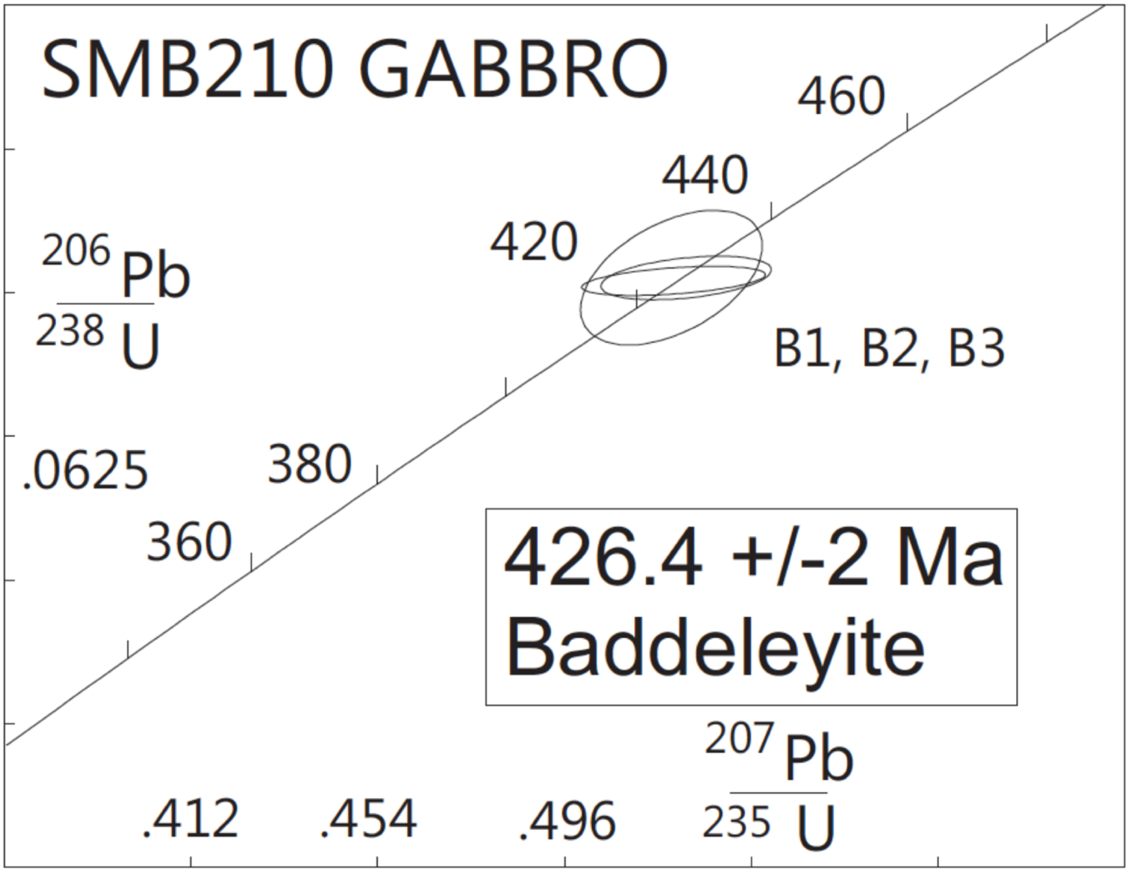

Fig.4.4. Silurian Mavillette gabbro U–Pb ID-TIMS isotopic data, for baddeleyite fractions B1, B2 and B3, yielding a concordant age of 426 +/- 2 Ma.

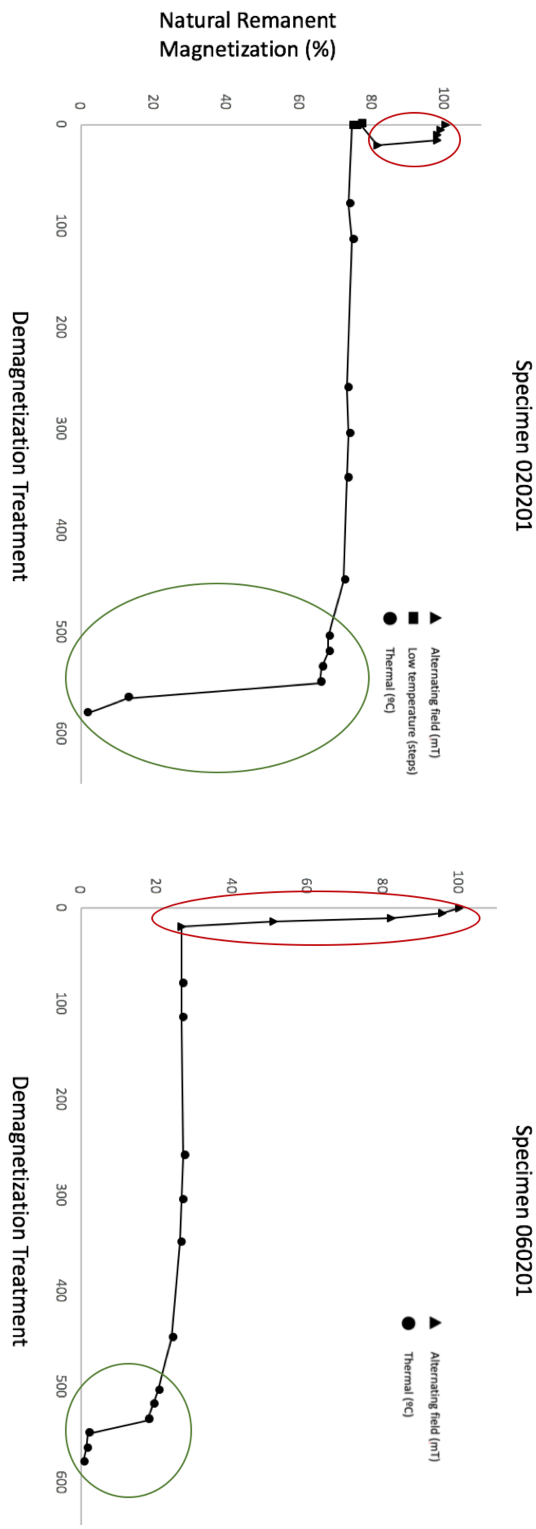

Fig.4.5. Remanence decay plots displaying typical demagnetization behaviour throughout the collection. The x axis illustrates the demagnetization steps, while the y axis illustrates the percentage of remanence remaining after demagnetization. The highlighted red area in both plots represent the removal of VRM and the highlighted green area represents ChRM.

resolvable as two magnetic components: *V* and *M*. The *V* component is interpreted to be a Viscous Remanent Magnetization carried by MD magnetite, typically removed by 20 mT and showing a scatter of directions.

Table 4.1 summarizes the directional information per site, however, only those with more than one cooperative specimen were included in subsequent calculations. Therefore, of the eight cooperative sites, five were capable of most confidently displaying a coercively hard *M* component that was removed during thermal demagnetization in higher temperature steps. The component was defined over a temperature range between 505–580° C, in which magnetite unblocked. The remaining sites that were incapable of providing useable directional data (sites 3, 5, 8, 9, 11) were found to have samples heavily dominated by MD magnetite, which were poor magnetic recorders as they lost all significant magnetization by 20 mT. In some cases, magnetization persisted up to 580ºC; however, the maximum angular deviation of the best fit lines exceeded 15 degrees, deeming them unacceptable.

One approach that was taken when initially running the pilot specimens in this study was to take sister specimens and expose them to a different combination of demagnetization techniques. When drill core samples are prepared for measurement, they are cut into two-to-four specimens and those originating from that core are sister specimens. Examples of three sister specimens that were subjected to different demagnetization come from core one from site seven (07010x). Specimen 070101 underwent three demagnetization processes (AF, low temperature and thermal). The second sister specimen, 070102 was subjected to only thermal demagnetization, and specimen 070103 went through only AF demagnetization. All three specimens failed to produce paleomagnetic results that were within the acceptable margin of error. The demagnetization behaviours are characteristic of rocks that are heavily dominated by MD magnetite (Figure 4.6).

Site	Average Mass (g)	Average Magnetic Susceptibility (E-6 m^3/kg)	V component	M component (in-situ)	α95	Bedding	M component (tilt-corrected)	α95
01	33.27	13.65	228°, -24°*	145°, 6°	7.4	165º/43º	154º, 8º	10.2
02	31.66	1.58	270°, -17°*	166°, 44°	3.4	197º/49º	216º, 49º	23.7
03	31.78	7.19	301°, 34°	N/A	N/A	N/A	N/A	N/A
04	31.73	10.33	264°, -21°	154°, 16°*	N/A	N/A	N/A	N/A
05	32.26	8.85	137°, 5°	N/A	N/A	N/A	N/A	N/A
06	32.90	1.78	253°, -22°	162°, 5°	10.5	137º/43º	159º, -13º	13.5
07	32.63	3.84	118°, -5°*	157°, 10°	10.7	137º/43º	159º, - 6º	13.5
08	32.30	9.05	198°, 8°	N/A	N/A	N/A	N/A	N/A
09	33.13	7.82	3°, -18°*	N/A	N/A	N/A	N/A	N/A
10	33.54	7.54	165°, 11°	194°, 14°*	17.4	137º/43º	192º, -22º	13.5
11	32.22	3.76	236°, 1°	N/A	N/A	N/A	N/A	N/A
12	31.49	6.39	143°, 7°	164°, 26°*	N/A	175º/36º	183º, 27º	62.7
13	33.07	9.53	18°, 39°*	149°, 5°*	N/A	N/A	N/A	N/A

Table 4.1. Summary of paleomagnetic results on site-by-site basis for the Mavillette gabbro, Mavillette, Nova Scotia (44.1008ºN, 66.1852ºW). Sites highlighted with an asterisk (*) were not included in calculations, as the directional information was based on a single specimen from the site. Bedding was determined for sites 1, 2, 6, 7, 10 and 12, allowing for tilt-correction. The error associated with both the in-situ and tilt-corrected M component directions are represented by the α95 values.

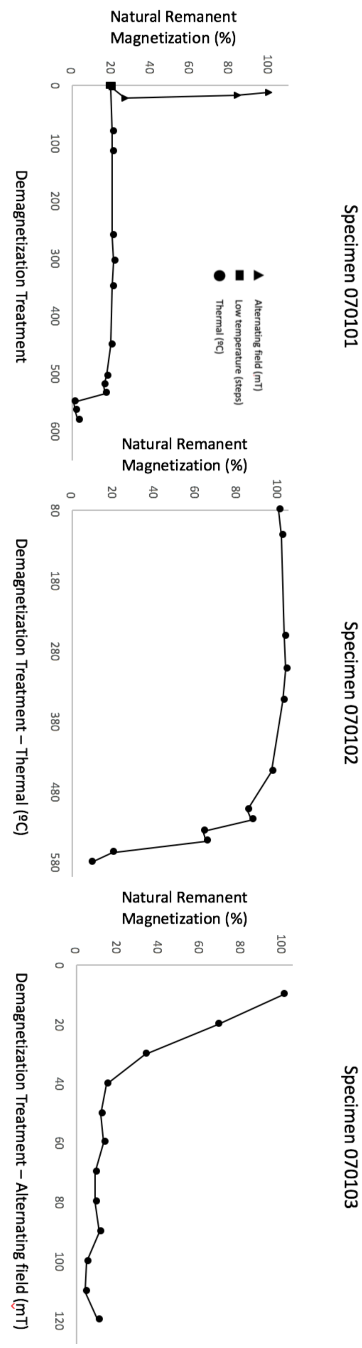

Fig.4.6. Comparison of demagnetization behaviour amongst sister specimens treated by different methods of demagnetization. Specimen 070101 was exposed to AF cleaning to 20 mT, followed by low temperature demagnetization liquid N_2 baths and then thermal stepwise demagnetization. Specimen 070102 was simply thermally step demagnetized, while 070103 was simply step AF demagnetized up to 120 mT. Remanence decay plots illustrate the significant loss of remanence in initial demagnetization steps in specimens 070101 and 070103, indicating the presence of low coercivity MD magnetite, whereas specimen 070102 shows no significant remanence loss until >450°C, implying that the MD remanence was retained to high unblocking temperatures.

Specimens 070101 and 070103 lost the majority of their remanence following AF and low temperature demagnetization. which are used specifically to suppress MD magnetite. The orthogonal plots of those two sister specimens illustrate that VRM was removed when MD magnetite was suppressed, with a steep down direction being revealed (Figure 4.7).

Site 1 produced specimens with the highest average magnetic susceptibility (Table 4.1), with magnetic minerals capable of recording and preserving ancient remanence. The average direction revealed by the specimens after magnetite had unblocked after 580°C, was southeasterly and nearly horizontal (145°, 6°). The remaining sites that were capable of producing interpretable results had relatively low average magnetic susceptibilities, disproving a possible correlation between high magnetic susceptibility and viable paleomagnetic data. Figure 4.8 shows that in addition to site 1, sites 2, 6 and 7 also revealed a southeasterly direction after thermal demagnetization up to 580ºC; however, the inclination was variable (4-44º). The *M* component from site 2 is distinctly different, with a much steeper inclination and was excluded from the paleopole calculation; the remaining three site averages with shallower directions were used.

The calculated paleomagnetic direction found in 14 specimens from two limbs of the folded Mavillette gabbro is approximately 155º, 8º ($\alpha95 = 13.5$, $k = 77.5$). The calculated paleopole based on the Mavillette paleomagnetic directions was determined to be 36.9ºN, 326.3ºE ($\alpha95 = 10$) (Figure 4.9). The pole is the most closely related to the Carboniferous portion of the apparent polar wander path for Laurentia (Torsvik et al., 2012), falling approximately 30º to the east. This implies that the remanence carried by the specimens were subject to a Carboniferous overprint. When bedding of the sill was accounted for and the site mean directions were tilt-corrected, there was no significant change in the clustering of the *M* component (Figure 4.10). However, when a fold test was conducted, the precision parameter, *k*, decreased as the percentage of unfolding increased

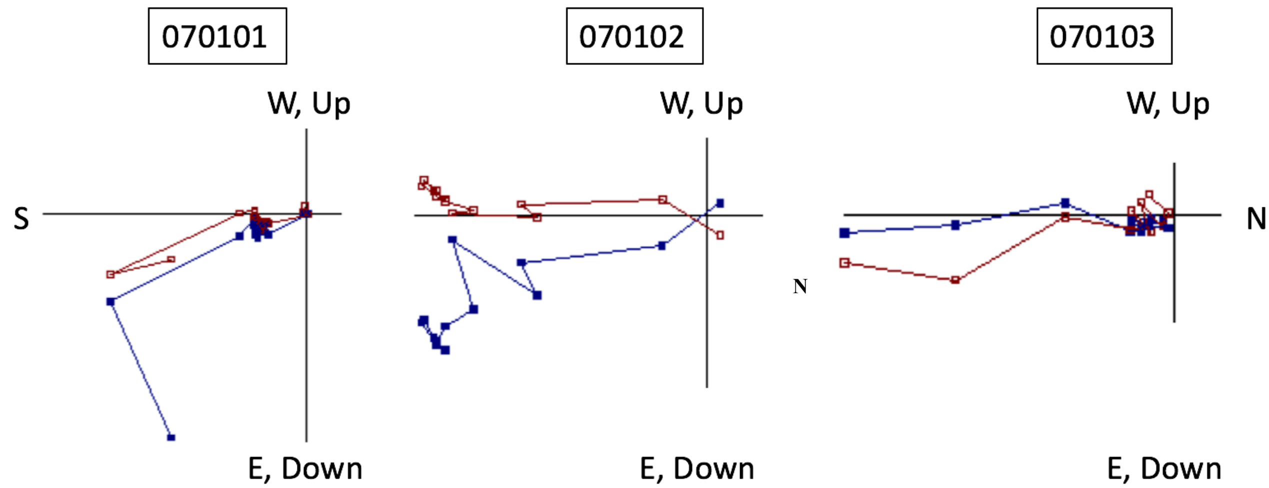

Fig.4.7. Comparison of demagnetization behaviour amongst sister specimens treated by different methods of demagnetization. Orthogonal vector plots illustrate the removal of a steep-down and northerly direction (VRM) in initial demagnetization steps in specimens 070101 and 070103, while the same direction as the generally high unblocking temperature remanence in specimen 070102.

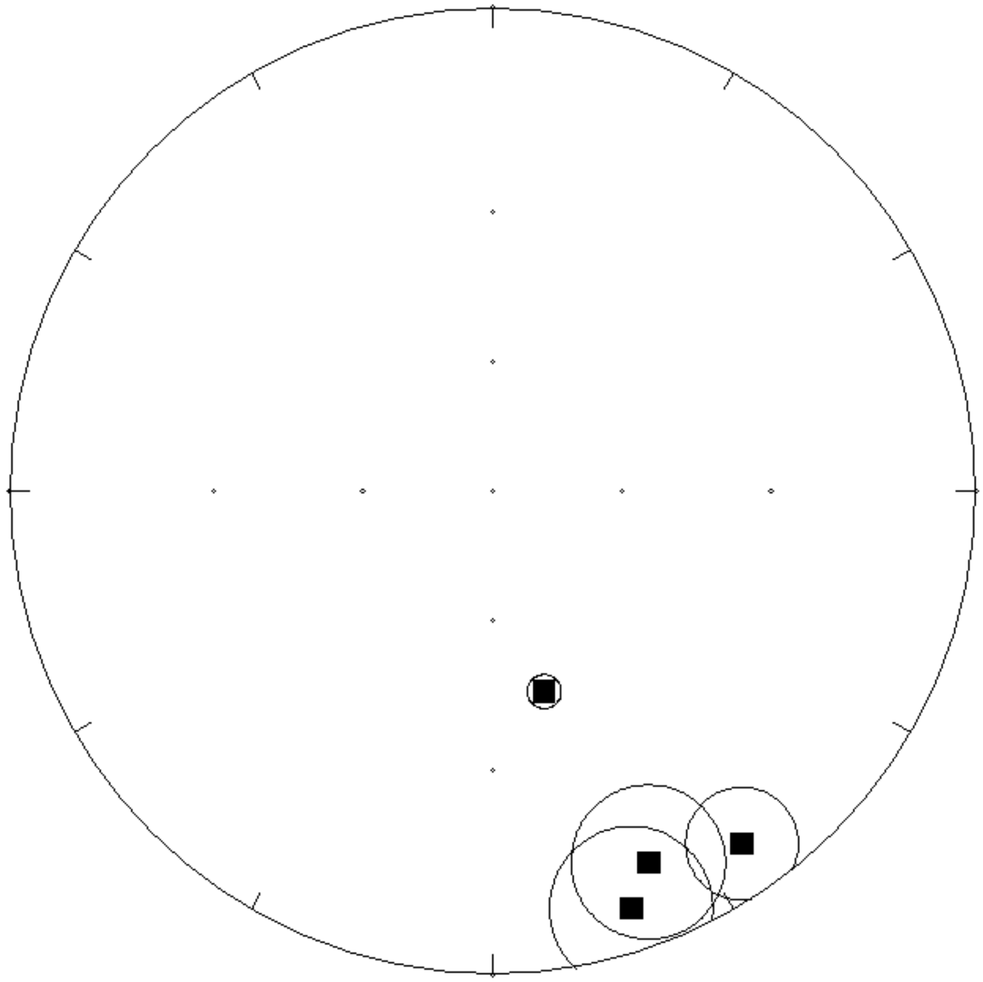

Fig.4.8. Equal-area plot of *in situ* site mean directions for the *M* component for four sites (1, 2, 6, 7).

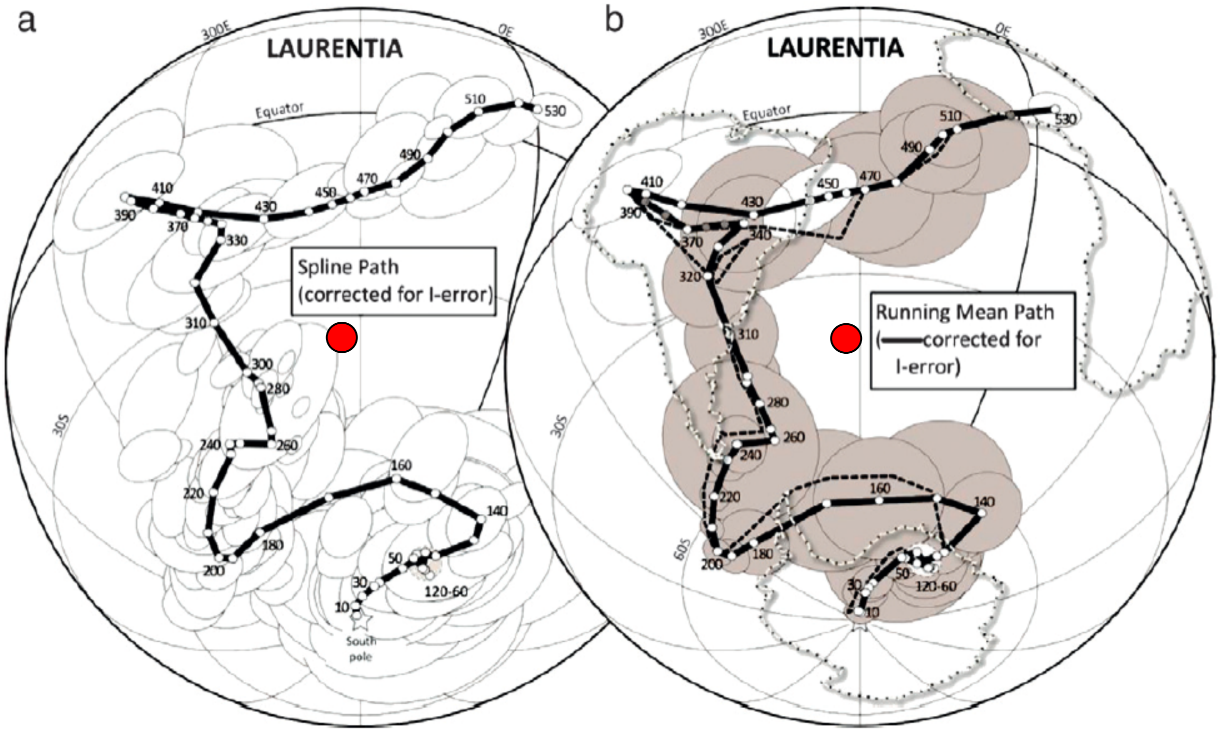

Fig.4.9. Calculated paleopole (36.9ºN, 326.3ºE, α95 = 10) (red) based on Mavillette paleomagnetic directions, D=155º, I=8º (α95 = 13.5, k = 77.5) (Torsvik et al. 2012).

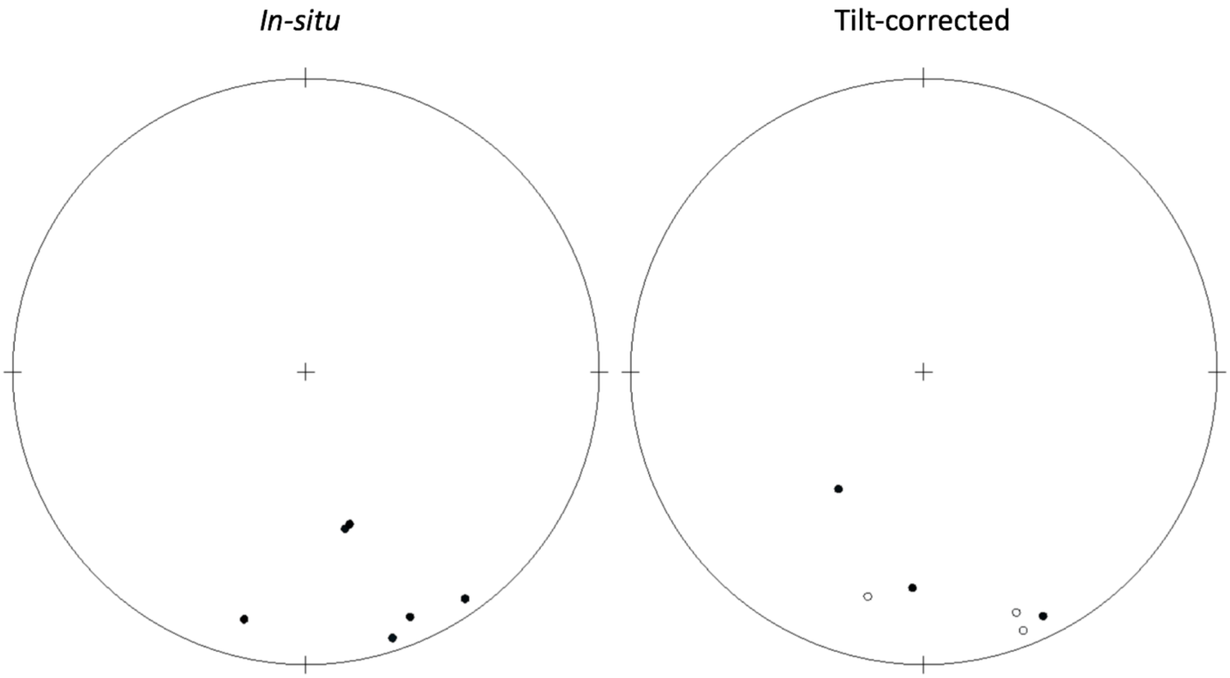

Fig.4.10. Equal-area plot comparison of the collection mean directions for the *M* component before and after bedding was accounted for. The clustering of the data does not change significantly after tilt-correction.

(Table 4.2; Figure 4.11). This implies that the paleomagnetic data is most reliable in its current morphological state and that the magnetic field directions were acquired post-folding. Therefore, the Mavillette specimens failed a fold test, dismissing the possibility of the paleomagnetic information to be primary.

The Carboniferous overprint direction implies that the magnetization is post-folding, as the deformation occurred approximately 390 Ma. The corresponding paleolatitude calculated is approximately 10º, placing the terrane near the equator.

4.5. Discussion

Paleomagnetic analysis indicates that the Mavillette specimens (with igneous crystallization age of 426 +/- 2 Ma) were unable to deliver primary remanence on the basis of a failed fold test and directional information that resembles a significant overprint event. However, the specimens were capable of delivering ancient remanence that was likely acquired at some time after deformation. The expected magnetic field direction at Meguma as it arrived at Laurentia in the mid-Devonian is approximately 180°, 60°, based on the reference apparent polar wander path for Laurentia (Torsvik et al. 2012). The overprint direction revealed by the Mavillette specimens was 155º, 8º, likely acquired through orogenic processes related to the formation of the Alleghenian mountain belt during the Carboniferous, rather than Neoacadian deformation during the Devonian (Figure 4.12). ^{40}Ar-^{39}Ar data from the Yarmouth area displayed cooling ages of 325 +/- 1.9 Ma, interpreted to be related to an Alleghenian overprint event (White 2012; White and Horne 2012). The Mavillette specimens may have also been affected by the same event.

This ancient remanence may have been the result of: 1. Thermoremanent magnetization (TRM), acquired during cooling from high temperature or 2. Chemical remanent magnetization (CRM), formed by growth of ferromagnetic grains. The heat associated with continental collision

%	Declination	Inclination	k	α95
-50	158	19	19.02	15.8
-40	159	19	18.54	16.0
-30	161	19	17.72	16.4
-20	162	19	16.64	16.9
-10	163	18	15.42	17.6
0	164	18	14.14	18.4
10	166	17	12.88	19.4
20	167	17	11.68	20.5
30	168	16	10.58	21.6
40	169	15	9.58	22.8
50	170	15	8.69	24.1
60	171	14	7.90	25.4
70	172	13	7.21	26.8
80	173	12	6.60	28.2
90	174	10	6.07	29.6
100	174	9	5.60	31.1
110	175	8	5.19	32.5
120	176	6	4.83	34.0
130	176	5	4.51	35.5
140	177	4	4.23	37.0
150	177	2	3.99	38.4

Table 4.2. Raw data used to conduct a fold test for the Mavillette specimens. % corresponds to the percentage of unfolding, k corresponds to the precision parameter and the α95 corresponds to the error.

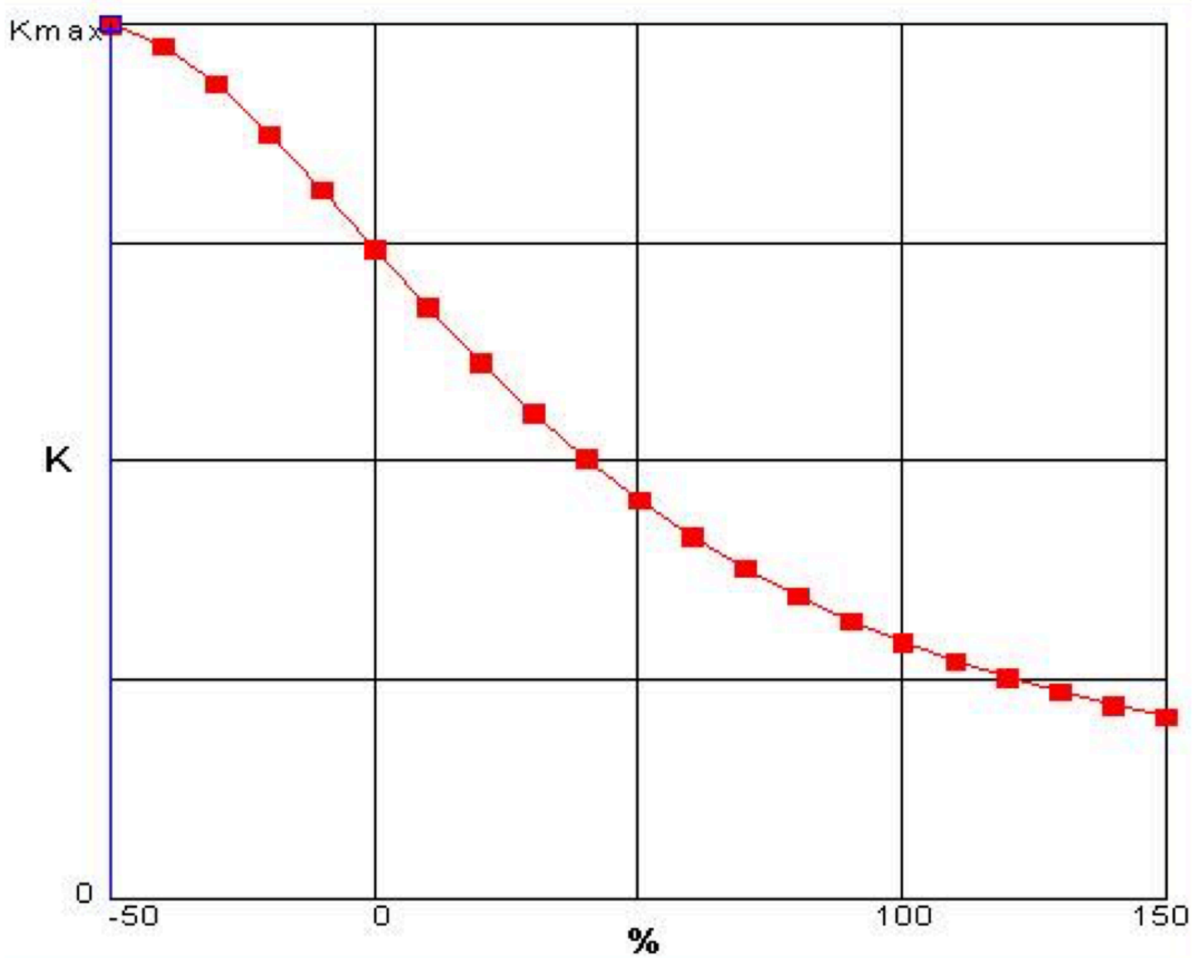

Fig.4.11. Precision parameter, k, plotted against the percentage of unfolding. Maximum precision occurs before 100% unfolding (in-situ).

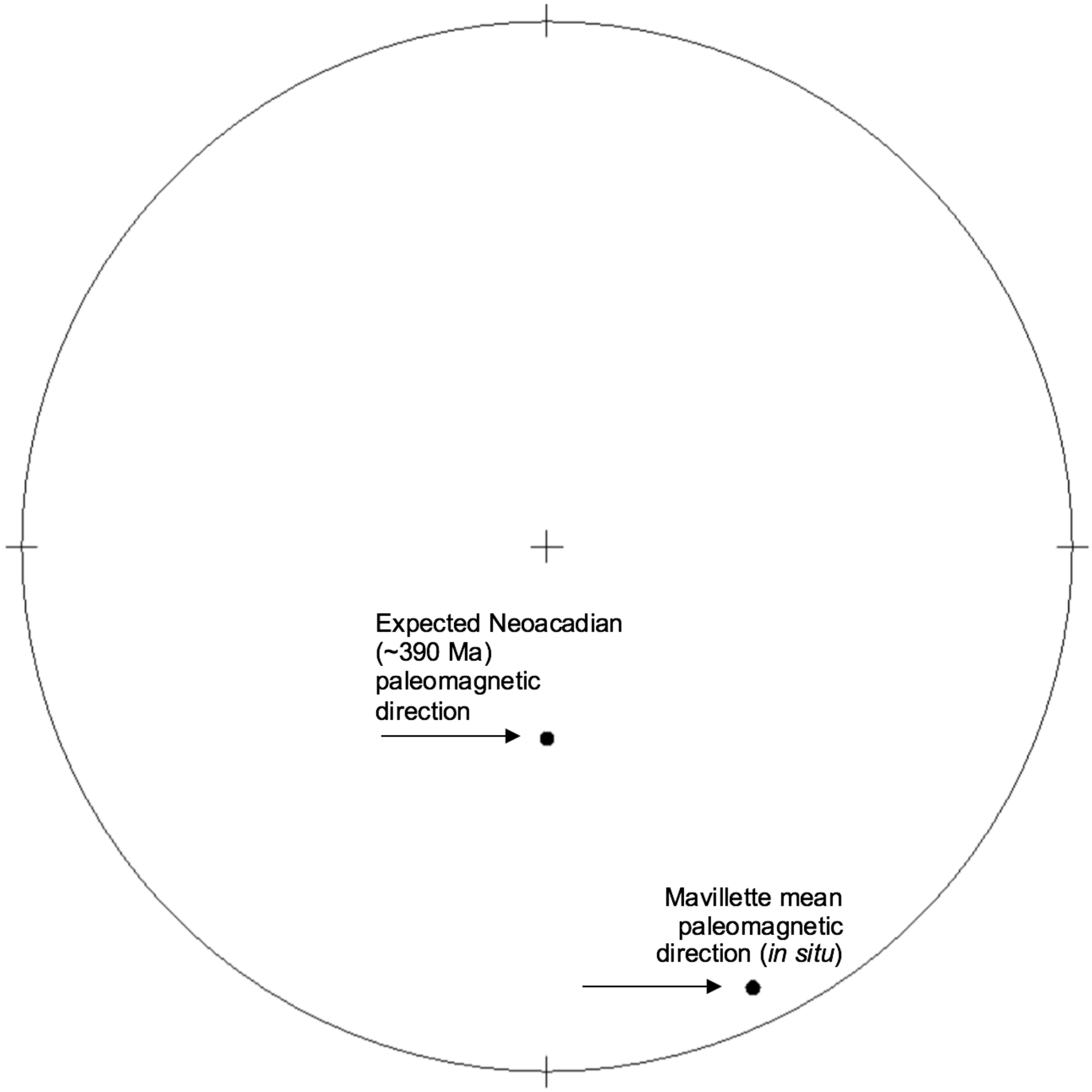

Fig.4.12. Equal-area plot of the collection mean directions for the *M* component (drawn from Table 4.1) of the Mavillette gabbro compared to the expected mean direction (D=180º, I=60º) at Meguma as is arrived at Laurentia during the Devonian (390 Ma).

produced some heat, however, substantial burial would have had to occur in order to surpass temperatures of >500ºC, in which primary magnetizations carried by magnetite could be replaced with secondary magnetizations. Furthermore, TRM is not easily acquired by MD grains, making CRM the likely carrier of the ancient remanence (Butler 1992). The gabbro underwent considerable alteration during deformation and orogenic events, allowing for the acquisition of CRM. The remagnetization of the altered magnetic markers in the intrusion may have destroyed the primary remanence. Although primary directional and paleogeographical information was not found, the information carried by the CRM was capable of providing insight on the magnitude of the Alleghenian mountain building episode. Evidence for CRM was displayed clearly in one core from site 6, as two sister specimens from the same core demonstrated exact opposite magnetic field directions. Demagnetization of specimen 060301 revealed a southeasterly and moderate direction, while a northwesterly and moderate direction was removed from specimen 060303 from the same core sample. Previous occurrences of reversed polarity can be observed of Mesozoic strata in western Australia, in which CRM was acquired during the Early Cenozoic and geomagnetic polarity reversal (Schmidt and Embleton 1976).

The south-southeast and shallow-down direction displayed by the specimens place the Meguma terrane at low latitude and were acquired during post-folding orogenic activity, sometime in the Carboniferous. The paleomagnetic results reported support the need for further paleomagnetic investigation regarding the land masses that once bordered the Iapetus Ocean during the Paleozoic, in order to resolve and refine the paleogeographic reconstructions with primary information.

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CHAPTER 5 – DISCUSSION

5.1 Significance of overprint directional information

Despite failing to report primary remanence for the specimens investigated in Chapters 3 and 4, ancient remanence was revealed. The Cambrian Port au Port Group, Ordovician St. George and Table Head Groups, as well as the Silurian Mavillette gabbro, displayed very similar directional information that has been interpreted here to have been acquired during the Alleghenian orogeny in the Carboniferous.

The magnetic-field directions exhibited by all specimens in this thesis with an *M* component are similar to directions reported by Deutsch and Prasad in 1987, as well as Hodych et al. in 1990. In both of these studies, the remanence was interpreted to have been acquired during the Kiaman reverse polarity superchron during the Late Carboniferous-Early Permian. The remanence was acquired post-folding, as the accepted age of deformation for all rock units sampled is Devonian (Schillereff and Williams 1979; Cawood and Williams 1988; Hodych et al. 1990; White et al. 2012). Therefore, only in situ directions were considered when comparing pole positions on the APWP (Hodych et al. 1990).

The ancient remanence carried by the magnetic minerals in both chapters is mostly likely the result of CRM, formed by growth of ferromagnetic grains. The considerable alteration during deformation and orogenic events in the Carboniferous likely allowed for the acquisition of CRM. Although primary directional and paleogeographical information was not found, the information carried by the CRM was capable of providing insight on the magnitude of the Alleghenian mountain building episode, in addition to the local tectonic and thermal history of Laurentia.

The Carboniferous paleomagnetic information displayed by the specimens in this thesis agree with the well-established Carboniferous-Permian Kiaman overprint in the paleomagnetic record. The mean Kiaman pole (Irving and Strong 1985; Beaubouf et al. 1990) was located at 44ºN, 126ºE, whereas the mean antipole for this thesis was located at 39ºN, 149ºE.

5.2 Possible mechanisms of remagnetization

The Appalachian orogeny has been proposed to have been the root cause for the remagnetization of Paleozoic rocks along the ancient Laurentian margin and reported anomalous paleopole positions have been attributed to the Kiaman reverse polarity superchron (McCabe et al. 1983; Irving and Strong 1985; Kent 1985; Miller and Kent 1986; Beaubouf et al. 1990). Fluid migration associated with orogenic activity is interpreted to be the most likely mechanism for remagnetization. Several studies have exposed the susceptibility of limestones and dolostones to remagnetization associated with diagenetic processes (Piper 1987; Miller and Kent 1988). Although it has been proven that the effects of the Alleghenian orogeny are minor in the Canadian portion of the Appalachians compared to the American Appalachians, there is evidence of fluid migration during the Late Paleozoic (Williams and Hatcher 1983; McCabe and Elmore 1989). Regional patterns of remagnetization in Appalachian carbonates have been attributed to the movement of chemically-active fluids that migrated from the orogenic zone and into the craton.

The migration of fluid can occur laterally, vertically or as a result of uplift. In the case of lateral fluid migration, fluids associated with foreland basin developed can be expelled due to overpressure from rapid sedimentation (Sharp 1978). It is also possible for the movement of thrust sheets to cause lateral compression and move fluid into the craton (Oliver 1986). However, the most likely mechanism involved in lateral fluid movement is from gravitational flow, in which fluid travels from mountain highlands through aquifers into the adjacent foreland (Bethke 1986). Furthermore, vertical fluid migration occurs as a result of deformation structural features, such as faults and fractures (McCabe and Elmore 1989). Lastly, uplift and exposure to meteoric water in

Carboniferous time is a likely driver for the remagnetization of vulnerable strata, such as the carbonates of the Port au Port Peninsula.

In the 1990 paleomagnetic investigation of the Port au Port Peninsula, Beaubouf et al. reported the prevalent structural features in the region that would have made fluid migration and subsequent remagnetization likely. Features such as high-angle faults, collapse breccias and karstified surfaces are widespread along the Peninsula.

5.3 Current understanding of Paleozoic paleogeography of Atlantic Canada based on faunal provincialities

As stated in Chapter 1 of this study, the paleogeographic history of ancient North America as a whole during the Early Paleozoic is highly debated due to significant gaps in viable paleomagnetic data (Stampfli and Borel 2002; Murphy et al 2004; McCausland et al. 2007; Mitchell et al. 2012). Magnetic overprinting from the present-day field and extensive remagnetization events (i.e. orogenic processes) have rendered much of the data difficult to rely upon, or unusable. A few regions without paleomagnetic data for this time period include crustal terranes, like Avalonia and Meguma, that have been transported to Laurentia during supercontinent assemblage. Those terranes in particular are important pieces of North America's paleogeographic history, as they represent the culmination of the Appalachian collisions.

The use of diagnostic fossils in determining faunal provinces has aided in attempting to fill the gap in which paleomagnetic data is lacking. Avalonia and Meguma were most closely associated with West Gondwana in the Early Paleozoic (Cambrian-Early Ordovician), as indicated by the similarities in trilobite taxas (Figure 5.1). The assessment of trilobite fossils led to the recognition of four very distinct provinces: *Bathyurid* (Laurentia), *Megalaspid* (Baltica), *Dicelocephalinid* (East Gondwana) and *Calymenacean-dalmanitacean* (West Gondwana).

Fig.5.1. Faunal provinces in the Early Ordovician based on trilobite fossils (Fortey and Cocks 2016).

The fossil evidence indicates that the terranes were mutually inhabited by trilobite species from the *Calymenacean-dalmanitacean* province (Whittington and Hughes 1972; Fortey and Cocks 1992; Fortey and Cocks 2003; Fortey 2011; Fortey and Cocks 2016).

The brachiopod fauna of Middle Ordovician Avalonia shows some similarity to the fauna of Laurentia, implying separation from West Gondwana and marking the beginning of the terrane's drift to Laurentia (Fortey and Cocks 2003). At this point, the Meguma terrane would not have rifted from the Gondwanan landmass (Murphy et al. 2004). Based on brachiopod genera, three unique provinces are recognized: *Cyclospira/Colaptomena* (Laurentia), *Estlandia* (Baltica) and *Tissintia* (Gondwana) (Lees, Fortey and Cocks 2002; Zhan, Jin and Chen 2007; Cocks and Fortey 2009; Winrow and Sutton 2014).

The fauna of Avalonia shows a hybrid faunal signature, with members from the *Tissintia* province, as well as members from the *Cyclospira/Colaptomena* province (Figure 5.2). There were more brachiopod genera from the *Colaptomena* province found in Avalonia during this time, implying a closer relationship to Laurentia. Furthermore, Lees, Fortey and Cocks (2002) analyzed 80% of the total genera known from 4 plates, with a total of 623 trilobite genera and 622 brachiopod genera. 30 genera were shared exclusively between Avalonia and Laurentia, compared to only 26 genera shared between Avalonia and West Gondwana (Figure 5.3). This supports the notion of a closer relationship between the terrane and Laurentia during this time in geological history. Additionally, there is no faunal similarity to Baltica based on brachiopod fossils alone, as native genera of Baltica were not found in Avalonia during the Middle Ordovician (Cocks 2000; Lees, Fortey and Cocks 2002). Based on these data, Avalonia was an independent terrane and had not yet collided with Baltica, which was nevertheless in close proximity (Cocks and Torsvik 2005). Paleomagnetic data suggests that Baltica was rotating and approaching Laurentia as well at this

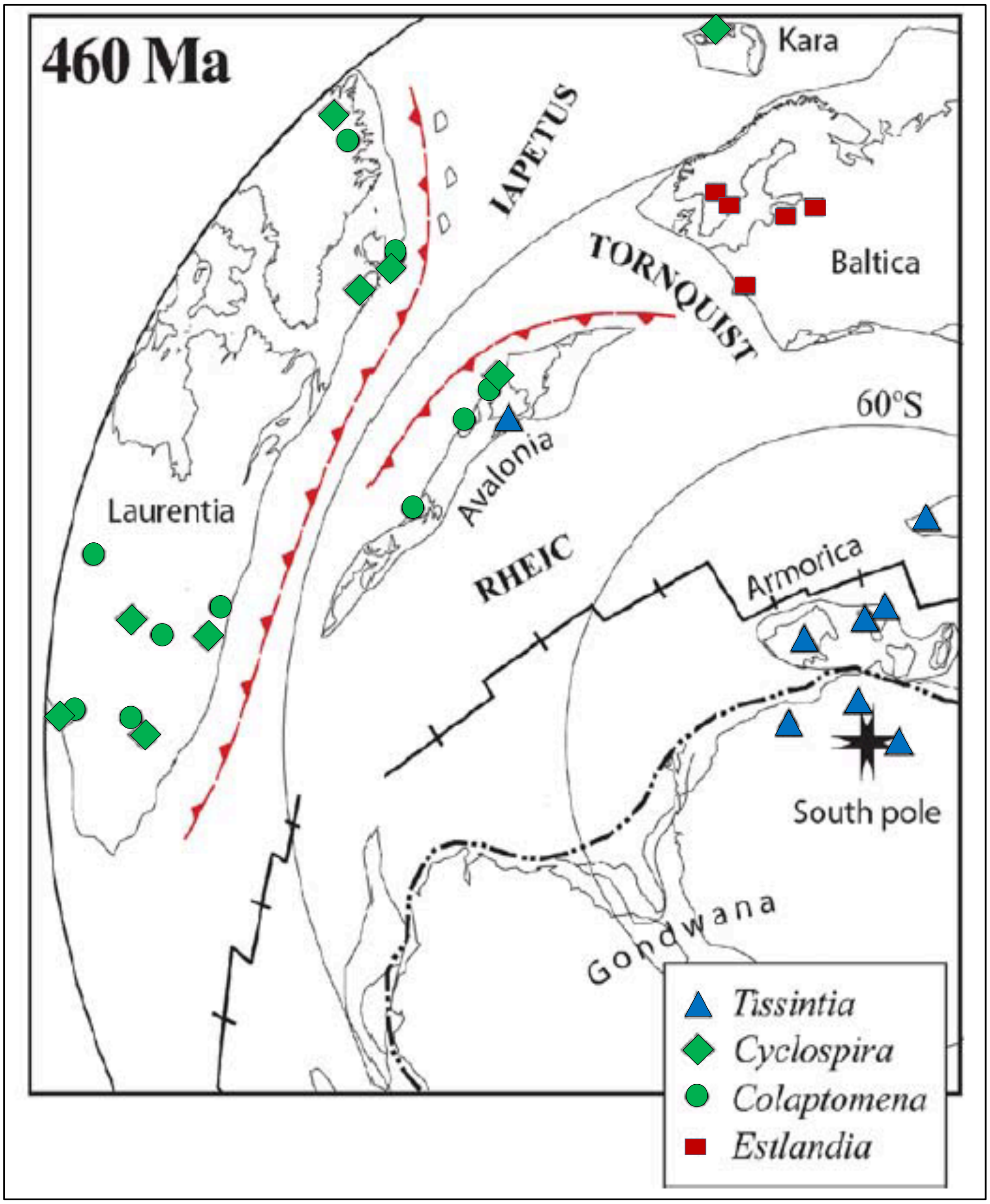

Fig.5.2. Faunal provinces in the Middle Ordovician based on brachiopod genera (adapted from Cocks and Fortey 2009).

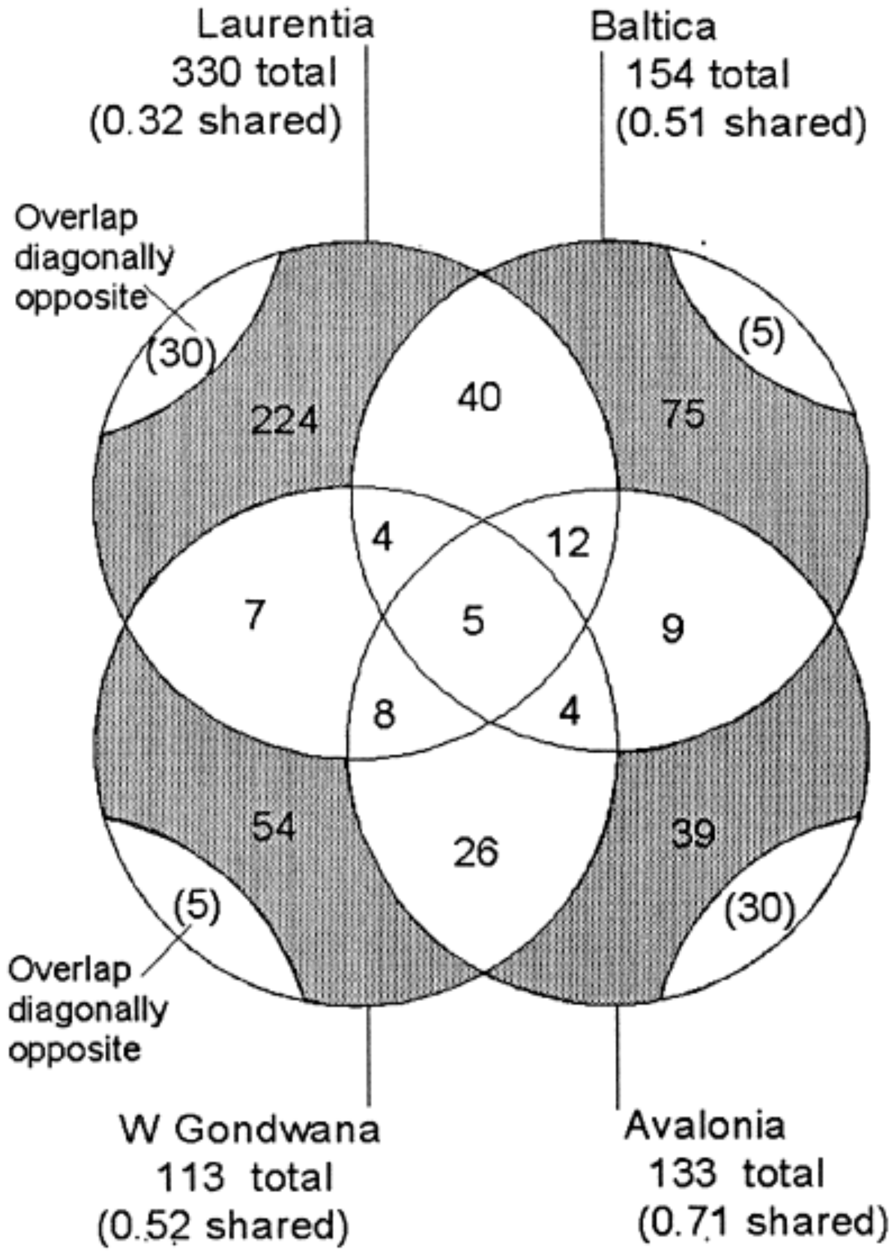

Fig.5.3. Faunal similarities among the 4 paleo-and micro-continents in the Middle Ordovician based on brachiopod and trilobite fossils. The shaded areas represent endemic fauna (Lees, Fortey and Cocks 2002).

time (Cocks 2000; Cocks 2001; Cocks and Torsvik 2005; Torsvik et al. 2012). However, the faunal differences between Avalonia and Baltica suggest that the two land masses had not collided at this point.

As noted above, the adverse consequences of the Ordovician-Silurian mass extinction on marine biota has created problems in the use of faunal assemblages for paleogeographic reconstruction, not only in terms of the reduction of diversity, but also due to the blurring of the warm-water faunal assemblages that existed prior to this event. That faunal rebound was delayed in the Early Silurian demonstrates the severity of climatic change that led to the mass extinction, with only a relatively minor proportion of the Late Ordovician fauna continuing to support the trend of Avalonia transitioning to a tropical setting.

By the Late Ordovician, the fauna of Avalonia was more similar to Baltica, and to a lesser extent, Laurentia, than West Gondwana. Williams et al. (2001) based Late Ordovician faunal provinces on ostracod genera, as they are quite abundant in the fossil record during this time, accounting for almost 80% of fauna in their study. They determined that Avalonia was the most similar to Baltica in terms of ostracod genera, with 90% similarity. The ostracod assemblages demonstrated close faunal affinities among Avalonia, Baltica and Laurentia, implying that the land masses were in fairly close geographic proximity to one another, but with sufficient differences to suggest that a migration barrier prevented full faunal exchange between Laurentia and Baltica/Avalonia (Williams et al. 2001). Thus, while it is still debated on whether or not Avalonia had collided with Baltica by the Late Ordovician, it appears that the two land masses were in close proximity to one another as they drifted northward towards Laurentia (Figure 5.4). This movement would eventually result in the closure of the Tornquist and Iapetus oceans and widening of the Rheic Ocean (Cocks 2000; Torsvik et al. 2012).

Fig.5.4. Paleogeographic reconstruction for the Late Ordovician period highlighting the proximity of Avalonia to Baltica, and Laurentia (Torsvik et al. 2012).

The mass extinction event adds yet another layer of complexity, as the brachiopod and trilobite data suggest that Avalonia was more closely related to Laurentia than Baltica during the Late Ordovician (Lees, Fortey and Cocks 2002). Paleomagnetic data and tectonics suggest that the terrane would not have arrived to Laurentia until the Early-Mid Silurian (Cocks 2000; Cocks 2001; Cocks and Torsvik 2005). Therefore, basing reconstruction on faunal information alone can result in misleading paleogeographic models. The placement of Avalonia near Baltica and Laurentia, as based on the ostracod record is more widely accepted due to the fact that it supports reconstructions based on other methodologies.

The fauna of the Early Silurian, following the end-Ordovician mass extinction, became less endemic. Many Laurentian type brachiopods became extinct and the rebound that occurred afterwards resulted in the Laurentian ecosystems being populated with genera that were previously only found on other paleocontinents (Cocks and Jia-yu 2008; Candela 2015). There was an invasion of typical cool water fauna found in higher latitudes into tropical regions like Laurentia (Jin 2003).

Prior to the mass extinction, there was a clear divide between the warm-water *Pentamerus* brachiopod community of Laurentia and the cool-water *Eocoelia* brachiopod community of West Gondwana (Jin 2003; Gushulak, Jin and Rudkin 2016). However, global cooling resulted in the *Eocoelia* fauna to spread to tropical regions. Therefore, due to the more cosmopolitan and homogenized nature of brachiopod assemblages during this time (dominated by cool-water taxa), they do not provide any additional information on the positions of terranes.

Based on several reconstructions that have incorporated other means of correlation, Baltica and Avalonia collided by the Early Silurian, with the the new amalgamation moving closer to Laurentia (see Figure 4.1). It is also at this point in time that Meguma began its rift phase from

West Gondwana, as indicated by the initiation of on rift-related magmatism (Murphy et al. 2004). Howeve, as mentioned in Chapter 1, details of the movement of Meguma remain poorly understood due to the cosmopolitan (versus endemic) nature of mainly deep water fauna contained in Early Paleozoic rocks of Meguma.

5.4 Summary and concluding remarks

Four groups ranging in age from Cambrian to Silurian belonging to autochthonous and allochthonous strata were sampled from regions in Atlantic Canada that represented the 'bookends' of the Appalachian orogeny. The Cambrian-Ordovician aged carbonates of western Newfoundland documented the passive margin phase of the Laurentian margin, in addition to the early stages of the Taconic orogeny. The Silurian gabbro of Mavillette, Nova Scotia characterized the rifting of the Meguma terrane from Gondwana and to Laurentia. The objective was to extract stable magnetizations that would represent the magnetic-field direction for each of the time periods in which the rocks formed.

The magnetic intensities varied between the carbonates and the gabbro, with the specimens in Chapter 3 being very weakly magnetized. Nevertheless, the cooperative specimens from all groups demonstrated stable magnetic components after demagnetization techniques were applied.

Cambrian specimens belonging to the Port au Port Group produced three stable components, *V*, *I* and *M*. The *V* component is an overprint that is consistent with the present-day magnetic field. The *I* and *M* components are most likely carried by diagenetic magnetite, consistent with several reported Kiaman reverse polarity superchron magnetizations for Laurentia. The pole position corresponding to the *M* component is 40ºS, 331ºE.

Ordovician rock samples belonging to the St. George and Table Head groups were somewhat problematic, failing to yield more than two stable components. The St. George Group specimens were failed to reveal directions other than the present-day field, carrying only a *V* component. Specimens from the younger Table Head Group revealed *V* and *I* components, comparable to those of the Port au Port Group, implying that magnetization was also acquired during the Carboniferous.

The Mavillette specimens (426 +/- 2 Ma, U-Pb baddeleyite) were unable to deliver primary remanence on the basis of a failed fold test and directional information that resembles the significant overprint event in which the carbonates of the Port au Port Peninsula were also affected. The *M* component revealed after thermal demagnetization up to 580ºC was used to calculate a paleopole of 36.9ºS, 326.3ºE.

The paleopole positions calculated for the Cambrian carbonate specimens of the Port au Port Group and the Silurian gabbro specimens of the Mavillette intrusion were fairly similar (Figure 5.6), illustrating the extent of deformation and alteration associated with the Alleghenian orogeny and its effect on the magnetic information retained by the rocks of those regions.

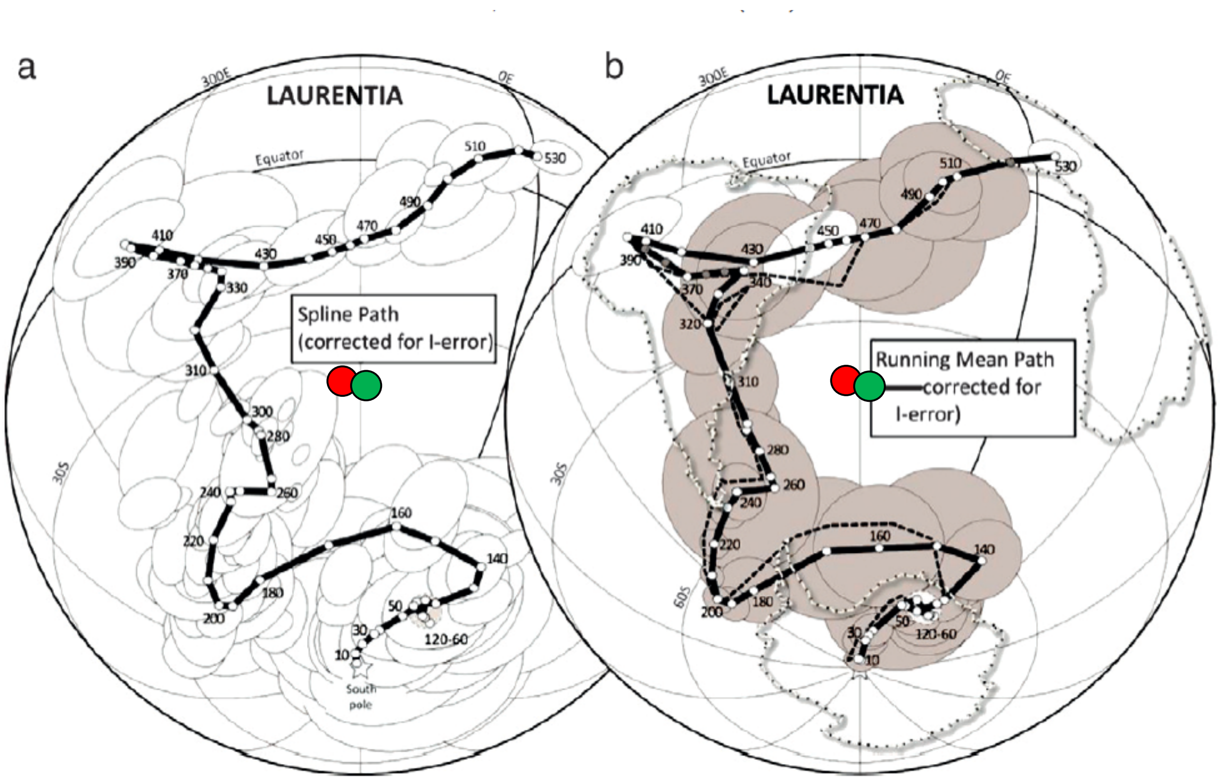

Fig.5.6. Comparison of calculated paleopoles for the Port au Port specimens (green) and Mavillette specimens (red).

5.5 References

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APPENDICES

The following appendices (A, B, C, D) correspond to the raw data collected during stepwise demagnetization for each specimen with a stable component of remanence. The declination (DECL.) and inclination (INCLIN.) are in degrees, while the magnetic intensity (INTENSITY) is in c.g.s. units of emu, assuming a specimen volume of 10 cm^3. Appendix A, B and C correspond to the data used in Chapter 3, for the Port au Port Group, St. George Group and Table Head Group, respectively. Appendix D corresponds to the data used in Chapter 4, for the Mavillette gabbro.

APPENDIX A

SPECIMEN 010301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	130.08	26.19	6.54E-08	2.5
5	147.25	22.11	5.83E-08	2.2
10	152.90	15.56	5.56E-08	2.1
15	151.84	1.85	5.35E-08	2.6
20	173.91	-8.02	5.49E-08	3.1
110	162.65	-12.90	8.57E-08	4.0
260	157.59	-24.93	9.33E-08	2.5
305	159.32	-22.55	6.85E-08	2.1
350	162.42	-12.33	4.60E-08	3.0
450	153.52	-16.63	3.20E-08	2.9
505	171.23	-21.29	2.56E-08	3.3
520	160.19	-6.71	2.65E-08	2.2
535	141.14	2.02	2.59E-08	2.4
550	134.58	-40.95	1.39E-08	2.0
565	110.66	22.08	3.28E-08	2.5
580	30.22	56.18	1.90E-08	8.3

SPECIMEN 010401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	160.85	-1.59	4.83E-07	2.5
5	161.08	-3.46	4.84E-07	2.2
10	154.21	-4.11	4.85E-07	2.9
15	155.69	-5.73	4.91E-07	3.3
20	157.24	-5.84	4.92E-07	3.1
110	158.94	-8.38	5.01E-07	3.6
260	158.25	-10.21	3.98E-07	2.9
305	152.96	-10.31	3.75E-07	2.4
350	161.93	-9.86	2.75E-07	3.0
450	159.47	-7.00	1.08E-07	2.7
505	159.99	-9.75	9.13E-08	2.4
520	154.05	-8.03	7.67E-08	1.9
535	162.11	0.00	8.20E-08	2.8
550	172.84	-40.48	2.91E-08	1.2
565	137.89	-62.87	9.95E-09	3.2

SPECIMEN 010402

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	161.09	-8.16	3.87E-07	2.4
2	162.26	-7.85	3.83E-07	3.1
5	158.89	-8.72	3.85E-07	3.6
10	160.51	-10.16	3.92E-07	3.3
15	162.09	-12.69	3.99E-07	3.0
20	160.12	-12.11	4.02E-07	2.8
25	160.77	-12.72	4.06E-07	3.0
30	161.15	-13.70	4.05E-07	2.5
40	163.42	-14.10	4.05E-07	2.7
50	161.48	-14.35	4.05E-07	2.9
60	163.34	-14.78	4.05E-07	3.0
75	161.86	-15.14	4.03E-07	2.8
90	162.80	-15.56	4.02E-07	3.3
105	163.07	-15.52	4.02E-07	3.0
120	160.87	-15.44	4.01E-07	3.2
135	162.08	-15.70	3.99E-07	2.9
110	159.32	-16.36	4.02E-07	3.2
260	162.99	-18.00	3.49E-07	3.2
305	154.90	-17.90	2.38E-07	2.5
350	166.93	-19.77	2.15E-07	3.0
450	159.87	-49.29	1.32E-07	1.0
505	170.58	-20.58	7.86E-08	2.4
520	177.56	-5.51	7.87E-08	2.2
535	172.88	-35.77	5.51E-08	2.1
550	160.42	-21.15	3.90E-08	1.8
550	152.66	-51.27	5.57E-08	1.6
565	157.17	-52.02	5.58E-08	1.7
580	135.63	18.51	1.48E-08	2.4

SPECIMEN 010501

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	249.63	57.13	4.17E-08	1.6
110	168.97	-70.82	3.27E-08	3.6
260	121.77	-37.37	1.71E-08	1.9
305	115.10	-25.89	1.34E-08	2.1
350	117.35	-24.11	9.17E-09	2.2
450	15.63	-39.57	1.15E-08	2.9
505	140.01	-51.10	5.26E-09	2.7
520	10.20	-30.25	3.61E-09	26.5
535	4.57	-59.74	1.69E-08	6.0
535	3.42	-55.26	1.67E-08	1.4
550	194.10	-16.94	1.18E-08	1.1

SPECIMEN 010502

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
0	347.67	28.18	3.94E-08	2.2
2	350.57	27.44	3.93E-08	1.9
5	349.85	23.70	4.01E-08	2.5
10	352.85	17.47	4.05E-08	2.5
15	351.82	9.40	4.08E-08	2.7
20	356.05	6.97	4.25E-08	1.9
25	356.59	4.80	4.37E-08	2.5
30	357.90	4.18	4.37E-08	2.5
40	359.57	0.68	4.39E-08	2.8
50	357.97	-0.76	4.61E-08	2.4
60	357.66	-2.49	4.40E-08	2.5
75	1.89	-2.51	4.51E-08	2.0
90	357.82	-2.83	4.44E-08	2.1
110	5.92	0.04	4.40E-08	1.4
260	4.65	-4.18	4.12E-08	1.8
305	1.48	-14.04	3.51E-08	2.0
350	2.87	0.56	2.72E-08	1.4
450	47.64	-41.58	5.22E-08	3.6
505	91.39	-49.35	8.05E-09	2.1
520	349.80	-2.79	1.08E-08	3.7
535	259.43	-51.71	5.83E-08	2.9
535	259.08	-51.88	5.77E-08	3.4
550	9.93	-1.09	9.83E-09	3.3

SPECIMEN 010601

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
0	181.70	2.04	8.40E-07	2.3
5	181.72	-0.79	8.60E-07	2.5
10	179.24	-3.63	8.74E-07	2.3
20	181.78	-4.95	8.78E-07	2.2
0	178.23	-4.03	8.82E-07	2.1
25	178.19	-4.40	8.88E-07	2.4
30	177.64	-5.86	8.98E-07	2.2
40	178.72	-6.71	8.93E-07	2.4
50	176.47	-6.48	8.85E-07	2.2
60	176.81	-6.91	8.89E-07	2.4
75	174.48	-6.41	8.88E-07	2.0
90	178.03	-8.20	8.87E-07	2.2
110	179.54	-14.17	9.54E-07	2.4
260	176.43	-14.23	8.72E-07	2.3
305	176.43	-14.53	7.64E-07	2.4
350	182.94	-17.64	4.65E-07	2.2
450	174.61	-14.37	3.62E-07	1.8
505	180.30	-17.04	2.98E-07	2.4
520	175.83	-14.69	2.75E-07	1.6
535	172.27	-12.90	1.18E-07	1.8
550	179.22	-13.43	1.39E-07	2.1
565	182.42	-2.55	1.13E-07	2.3
580	190.89	-13.23	7.62E-08	2.9

SPECIMEN 020301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	168.98	75.06	3.76E-07	0.7
5	169.32	73.71	3.60E-07	0.6
10	171.24	70.43	3.34E-07	0.7
15	172.84	68.02	3.10E-07	0.8
20	172.53	66.70	3.04E-07	0.8
110	164.49	-0.79	3.12E-07	2.9
260	165.91	-8.46	3.35E-07	2.9
305	166.62	-7.36	3.08E-07	3.3
350	167.80	-9.61	2.95E-07	3.3
450	174.30	-12.46	1.73E-07	3.5
505	161.88	-15.83	1.46E-07	2.5
520	172.82	-12.95	1.34E-07	3.3
535	21.54	71.87	2.90E-08	2.7
550	171.96	-9.11	1.31E-07	3.1
565	168.51	-9.70	1.29E-07	3.0
580	178.48	-12.18	1.05E-07	3.3

SPECIMEN 020401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	164.54	51.59	4.79E-07	1.4
5	162.01	46.86	4.49E-07	1.8
10	162.41	40.06	4.27E-07	1.7
15	160.42	34.20	4.15E-07	1.6
20	159.24	32.81	4.16E-07	1.7
110	158.81	-4.10	4.83E-07	2.7
260	163.53	-17.36	6.40E-07	2.8
305	161.53	-17.66	6.04E-07	2.9
350	155.19	-18.18	5.49E-07	2.2
450	159.25	-21.97	3.60E-07	2.5
505	159.37	-20.21	3.23E-07	2.5
520	158.66	-19.71	2.67E-07	2.2
535	161.23	-21.85	2.59E-07	2.5
550	159.77	-21.92	2.98E-07	2.4
565	162.14	-19.59	2.86E-07	2.7
580	150.92	-20.38	2.85E-07	1.8

SPECIMEN 020502

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	159.38	17.55	6.83E-07	1.6
5	156.60	12.70	7.13E-07	1.5
10	157.06	11.03	6.99E-07	1.5
20	158.34	8.47	6.94E-07	1.3
0	152.33	8.63	6.85E-07	1.8
25	156.13	8.90	7.00E-07	1.6
30	155.08	8.25	7.01E-07	1.6
40	156.59	7.47	7.02E-07	1.5
50	158.30	7.16	7.01E-07	1.6
60	156.26	7.20	7.08E-07	1.5
75	160.57	6.05	6.91E-07	1.5
90	157.62	6.05	6.89E-07	1.5
110	160.50	-9.23	8.55E-07	1.4
260	159.61	-10.47	8.34E-07	1.9
305	157.44	-10.79	7.75E-07	1.6
350	167.08	-12.10	6.94E-07	1.4
450	166.16	-12.70	5.49E-07	1.6
505	163.41	-10.20	4.63E-07	1.5
520	164.36	-12.36	4.73E-07	1.3
535	167.29	-12.76	4.49E-07	1.6
550	165.57	-12.03	4.39E-07	1.6
565	164.15	-11.58	4.20E-07	1.8
580	166.58	-13.98	4.14E-07	1.6

SPECIMEN 020601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	155.63	62.05	3.01E-07	1.4
0	158.77	66.63	2.75E-07	1.3
5	157.44	69.36	2.63E-07	1.0
10	158.00	69.69	2.50E-07	1.1
15	161.54	66.34	2.45E-07	1.2
20	166.62	61.44	2.46E-07	1.5
110	161.20	-14.46	2.13E-07	2.2
260	162.89	-18.71	2.22E-07	1.4
305	164.95	-20.12	2.07E-07	1.7
350	164.96	-19.16	1.88E-07	1.5
450	154.88	-8.83	1.36E-07	1.9
505	159.66	-21.74	1.17E-07	2.0
520	167.95	-23.59	1.19E-07	1.3
535	144.89	29.82	1.13E-07	2.0
550	160.45	-22.64	1.09E-07	1.5
565	154.30	-14.21	9.08E-08	1.6
580	170.48	-26.23	9.78E-08	1.6

SPECIMEN 020701

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	47.58	10.20	8.76E-07	2.6
2	52.39	9.72	8.04E-07	1.9
5	59.79	9.45	6.28E-07	1.6
10	66.68	11.22	2.62E-07	1.6
15	67.49	21.07	2.52E-07	1.7
20	129.01	13.79	2.38E-07	1.9
20	133.01	21.52	2.26E-07	1.9
25	146.88	21.72	2.26E-07	1.4
30	149.41	19.75	2.38E-07	1.4
35	148.40	15.90	2.87E-07	1.3
40	154.27	16.14	2.64E-07	1.4
50	156.80	22.44	2.83E-07	1.5
60	157.59	21.37	2.63E-07	1.4
75	162.88	13.99	2.53E-07	1.9
90	157.39	18.73	3.19E-07	1.7
110	161.21	3.34	3.84E-07	1.8
260	162.94	-1.59	3.65E-07	2.1
305	164.75	-3.56	2.96E-07	1.9
350	160.24	-3.64	2.41E-07	1.5
450	153.61	-8.23	1.63E-07	1.5
505	161.85	-4.64	1.54E-07	1.7
520	169.01	2.02	1.30E-07	1.7
535	179.77	1.25	1.57E-07	2.9
550	173.98	-4.92	1.46E-07	2.4
565	183.57	-9.87	1.40E-07	3.2
580	172.43	-7.88	1.38E-07	2.4

SPECIMEN 030101

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha95$
0	187.20	78.98	1.38E-07	1.4
5	186.18	78.56	1.36E-07	1.5
10	185.25	78.55	1.27E-07	1.1
15	185.21	77.71	1.23E-07	1.4
20	199.76	76.91	1.23E-07	1.3
110	161.91	-4.15	9.06E-08	2.1
110	162.21	-4.33	9.05E-08	1.5
260	162.48	-12.05	8.07E-08	1.5
305	162.19	-12.42	7.61E-08	1.7
350	164.32	-7.91	6.94E-08	2.0
450	158.98	-7.40	4.44E-08	1.7
505	167.60	-18.27	3.78E-08	1.9
520	153.17	-39.85	5.55E-08	2.3
535	154.63	43.25	3.58E-08	3.6
550	165.53	-10.73	2.57E-08	1.6
565	156.56	-13.11	1.77E-08	2.0
580	191.53	-2.13	1.98E-08	3.5

SPECIMEN 030201

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha95$
0	349.57	70.41	9.35E-08	3.2
2	335.19	72.37	9.22E-08	2.9
5	330.44	79.27	7.27E-08	2.7
10	255.57	83.32	5.59E-08	2.1
15	254.53	83.34	4.98E-08	2.3
20	155.09	80.67	3.96E-08	1.8
20	167.88	80.52	3.84E-08	1.6
25	182.22	68.04	3.43E-08	1.4
30	174.33	70.19	3.33E-08	1.1
40	183.82	58.29	3.12E-08	1.0
50	184.41	52.14	2.96E-08	1.3
60	180.27	54.21	2.92E-08	1.1
75	198.99	53.97	2.87E-08	1.4
90	178.77	52.20	2.60E-08	1.2
110	164.10	-4.65	2.92E-08	2.6
260	160.86	-13.77	3.02E-08	3.1
305	166.32	-15.98	3.07E-08	3.0
350	168.79	-11.93	2.44E-08	2.1
450	187.71	-19.13	2.01E-08	2.1
505	157.02	-6.74	1.35E-08	2.4
520	219.89	-3.08	5.21E-09	12.2
535	136.51	11.73	1.31E-08	2.1

SPECIMEN 030501

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha95$
0	141.77	60.80	5.03E-08	0.6
5	149.67	57.72	4.88E-08	1.8
10	147.46	52.99	4.18E-08	2.2
15	153.59	46.03	3.58E-08	2.5
20	155.47	45.87	3.35E-08	2.6
110	157.09	-0.84	3.13E-08	2.7
260	151.66	-19.68	3.81E-08	2.6
305	151.95	-19.92	3.00E-08	2.7
350	161.01	-16.67	3.00E-08	2.5
450	153.71	-10.14	1.80E-08	2.6
505	172.82	-19.95	1.38E-08	2.3
520	155.59	-14.22	1.32E-08	2.2
535	254.39	50.09	3.36E-08	2.1
535	255.12	51.06	3.41E-08	2.4
550	212.87	-60.87	1.28E-08	2.3

SPECIMEN 030301

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha95$
0	160.69	26.10	2.78E-07	1.6
5	157.60	19.06	2.79E-07	1.7
10	155.37	11.34	2.75E-07	1.9
15	159.77	7.26	2.72E-07	1.8
20	161.41	6.46	2.76E-07	1.7
110	163.50	-13.52	3.42E-07	2.0
260	159.43	-18.47	3.21E-07	2.0
305	159.62	-18.17	3.08E-07	1.8
350	156.90	-15.98	2.21E-07	2.2
450	163.22	-14.65	1.50E-07	1.5
505	178.81	11.90	5.87E-08	2.1
520	166.83	-4.13	3.35E-08	2.0
535	201.09	65.25	5.50E-08	2.6
550	178.81	-25.14	5.24E-08	2.0
565	217.39	-52.09	7.70E-08	2.4
580	23.84	-57.33	6.82E-08	3.9
580	30.06	-57.58	6.94E-08	3.7

SPECIMEN 040101

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	240.61	68.38	1.74E-07	1.8
2	220.35	67.57	1.54E-07	1.4
5	203.55	67.56	1.44E-07	1.1
10	183.31	64.33	1.53E-07	1.2
15	185.86	65.80	1.73E-07	1.2
15	178.20	65.05	1.57E-07	1.1
20	176.01	63.35	1.55E-07	1.2
25	175.73	63.91	1.41E-07	1.1
30	175.69	62.02	1.71E-07	1.1
30	181.74	62.51	1.76E-07	1.2
40	179.62	62.68	1.75E-07	1.3
50	183.84	63.75	1.80E-07	1.1
60	167.20	61.56	1.54E-07	1.1
75	184.86	62.81	1.59E-07	1.1
90	183.32	60.91	1.45E-07	1.4
110	164.92	-14.19	1.55E-07	1.7
260	161.56	-18.78	1.49E-07	1.7
305	153.68	-17.86	1.26E-07	1.5
350	163.36	-11.91	1.07E-07	1.8
450	152.98	-4.81	5.55E-08	1.4
505	158.81	-11.75	5.33E-08	1.6
520	166.60	-8.03	5.17E-08	1.6
535	157.39	2.30	5.79E-08	1.7
550	216.15	-35.84	2.22E-08	3.8
565	231.60	9.77	2.81E-08	2.0

SPECIMEN 040201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	155.28	61.40	2.07E-07	1.6
5	154.22	56.30	1.96E-07	1.4
10	156.65	54.23	1.84E-07	1.7
15	158.40	51.29	1.69E-07	1.6
20	157.47	49.72	1.65E-07	1.8
110	159.43	8.24	1.62E-07	2.1
260	160.54	1.39	1.47E-07	1.6
305	160.78	1.14	1.27E-07	1.8
350	158.41	0.13	1.10E-07	1.9
450	160.20	2.85	8.35E-08	2.0
505	157.54	9.81	5.60E-08	1.9
520	162.92	25.12	3.75E-08	2.1
535	154.64	36.69	6.90E-08	1.6
550	159.89	37.84	3.39E-08	2.6
565	136.54	30.24	4.92E-08	1.7
580	171.35	-14.51	2.75E-08	2.7

SPECIMEN 040301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	117.24	85.61	2.33E-08	1.6
5	190.41	80.12	2.07E-08	1.5
10	199.09	71.19	1.60E-08	1.3
15	197.98	55.47	1.21E-08	1.6
20	166.33	28.24	1.19E-08	1.8
110	161.46	-14.76	1.84E-08	4.2
260	163.58	-33.09	2.18E-08	2.6
305	165.34	-32.00	1.97E-08	2.8
350	160.12	-8.04	2.07E-08	2.5
450	181.67	-35.55	1.76E-08	2.2
505	159.07	-42.67	8.81E-09	4.0
520	37.29	54.48	1.13E-08	2.4
520	40.11	55.92	1.17E-08	2.1
535	84.65	71.86	2.79E-08	2.4
535	85.96	71.91	2.82E-08	2.8
550	87.62	15.15	2.22E-08	2.2

SPECIMEN 040601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	172.65	44.56	1.54E-07	2.4
5	172.31	43.81	1.47E-07	2.2
10	172.86	42.59	1.37E-07	2.5
15	173.91	41.33	1.32E-07	2.4
20	168.62	36.61	1.26E-07	2.5
110	157.14	-19.46	1.43E-07	1.7
260	156.69	-24.23	1.45E-07	1.6
305	158.59	-23.10	1.34E-07	2.0
350	158.87	-20.88	1.29E-07	1.8
450	155.66	-17.80	1.01E-07	1.6
505	150.95	-14.67	5.99E-08	1.9
520	154.89	-6.71	5.68E-08	1.7
535	149.34	6.21	5.03E-08	2.0
550	173.89	-44.95	6.19E-08	1.9
565	164.87	-20.45	4.66E-08	2.4
580	153.48	17.06	2.10E-08	2.9

SPECIMEN 050301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	333.12	53.00	2.21E-07	1.1
5	336.27	50.94	2.08E-07	1.6
10	337.68	44.81	1.81E-07	2.2
15	338.84	38.50	1.66E-07	2.2
20	335.53	32.95	1.70E-07	2.0
110	335.88	26.43	1.61E-07	2.3
260	333.29	13.63	1.52E-07	1.6
305	337.00	17.19	1.27E-07	1.9
350	329.20	15.82	1.23E-07	1.8
450	306.84	-40.32	2.56E-08	1.7
505	316.27	-38.08	2.38E-08	1.5
520	234.17	-70.58	9.40E-09	2.7
535	314.20	23.24	1.91E-08	3.1
550	333.75	-54.00	4.69E-08	2.1

SPECIMEN 050401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	149.94	43.09	2.98E-07	2.3
2	148.02	42.34	2.97E-07	3.2
5	149.23	39.20	2.94E-07	3.3
10	147.09	33.97	2.83E-07	3.0
15	148.89	26.59	2.71E-07	3.0
20	147.73	25.93	2.61E-07	2.8
25	149.09	23.96	2.49E-07	3.0
30	148.64	13.05	2.29E-07	2.9
40	152.39	14.26	2.33E-07	2.9
50	154.21	7.41	1.97E-07	3.1
60	153.41	2.46	1.91E-07	3.0
75	150.76	2.71	1.82E-07	2.6
90	150.96	-4.81	1.83E-07	2.8
105	143.25	-10.75	1.93E-07	2.1
105	148.89	-6.71	2.02E-07	2.7
105	152.44	-12.10	1.78E-07	2.6
120	154.57	-3.18	1.92E-07	2.8
110	150.73	-6.30	1.98E-07	2.4
260	149.55	-12.02	1.76E-07	2.1
305	150.30	-8.01	1.72E-07	2.2
350	162.70	-11.41	1.23E-07	2.5
450	138.17	-19.19	7.71E-08	2.0
505	160.81	-23.20	6.80E-08	2.9
520	170.13	-18.21	5.65E-08	3.3
535	184.04	-37.95	6.55E-08	2.5
550	233.54	-15.47	6.52E-08	1.2
565	167.38	-51.85	9.16E-08	2.6
580	132.17	42.64	2.68E-08	4.7

SPECIMEN 050501

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	152.24	20.71	1.37E-07	3.5
5	153.70	16.10	1.33E-07	3.1
10	157.07	10.12	1.35E-07	3.1
15	155.57	5.60	1.34E-07	3.3
20	159.37	2.24	1.35E-07	2.8
25	160.35	-0.11	1.38E-07	3.1
30	162.79	-3.01	1.38E-07	2.6
40	162.91	-6.02	1.34E-07	2.7
50	167.95	-7.60	1.37E-07	2.1
60	166.75	-8.45	1.35E-07	2.2
260	164.64	-12.64	1.19E-07	2.6
305	166.92	-14.71	1.18E-07	2.6
350	168.46	-14.45	8.80E-08	1.8
450	161.78	-11.08	5.91E-08	2.6
505	307.22	-47.91	2.56E-07	3.1
505	307.72	-47.96	2.56E-07	2.8
520	166.51	-28.30	2.85E-08	2.9
535	167.24	-10.01	2.01E-08	3.3
550	175.48	-30.83	3.15E-08	2.5
565	123.41	-57.01	4.12E-08	4.2

SPECIMEN 050601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	131.59	29.19	2.17E-07	2.1
5	132.32	28.15	1.91E-07	2.3
10	141.80	23.96	1.72E-07	3.1
15	141.40	15.07	1.64E-07	3.2
20	140.00	11.66	1.43E-07	2.8
110	145.68	4.24	1.44E-07	4.1
260	143.17	-2.48	1.33E-07	2.8
305	141.69	1.03	1.29E-07	3.3
350	137.66	1.19	9.89E-08	2.8
450	161.65	-25.85	5.74E-08	3.5
505	141.72	-15.55	5.79E-08	2.6
520	164.21	-30.23	4.91E-08	3.1
535	124.64	21.27	4.27E-08	2.2
550	172.37	0.72	4.58E-08	3.4
565	178.16	-28.59	4.61E-08	3.4
580	104.18	-26.81	1.51E-08	4.6

SPECIMEN 060501

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
0	38.76	85.82	1.47E-07	2.2
5	78.70	81.62	1.10E-07	2.3
10	113.77	76.54	6.97E-08	2.6
15	127.70	64.84	4.03E-08	3.2
20	118.39	52.17	3.34E-08	3.9
110	112.95	48.46	3.28E-08	4.8
260	124.28	-3.65	3.47E-08	3.3
305	127.01	-11.54	3.43E-08	3.1
350	146.96	-24.30	2.48E-08	4.2
450	98.32	44.12	3.79E-08	7.3
505	307.43	-26.76	8.80E-08	3.6
520	201.84	-62.57	6.62E-08	6.3
535	91.44	-41.19	8.02E-08	6.4
550	318.55	-40.08	9.60E-08	5.3

SPECIMEN 070101

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
0	60.23	74.62	1.21E-07	3.0
110	60.28	72.41	8.31E-08	3.0
260	98.01	37.55	1.94E-08	3.8
305	93.38	38.51	1.56E-08	3.6
350	163.01	0.99	2.27E-08	4.3
450	199.87	-8.10	7.41E-08	8.6
505	168.40	14.04	9.55E-08	10.7
520	109.59	-66.36	1.79E-07	4.3
520	92.40	-67.99	1.63E-07	4.4
535	230.45	-49.23	1.95E-07	3.8
550	140.91	-66.55	1.67E-07	7.2

SPECIMEN 070201

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
0	310.36	66.85	1.28E-06	3.3
2	314.62	66.57	1.29E-06	3.4
5	309.81	67.02	1.27E-06	3.5
10	312.88	66.95	1.23E-06	3.4
15	312.05	66.53	1.23E-06	3.3
20	311.08	67.78	1.22E-06	3.1
25	312.17	66.92	1.22E-06	3.4
30	312.97	66.86	1.19E-06	3.2
50	313.14	66.66	1.20E-06	3.2
75	314.27	66.22	1.19E-06	3.2
110	146.79	22.36	2.24E-07	2.2
260	147.67	12.41	2.01E-07	1.8
305	110.42	61.79	2.24E-06	0.2
305	110.41	61.76	2.24E-06	0.2
350	156.66	24.67	1.47E-07	1.8
450	167.63	30.78	8.38E-08	2.2
505	160.23	30.11	8.44E-08	2.1
520	166.66	31.86	7.75E-08	2.5
535	158.03	20.33	1.20E-07	2.6
550	162.78	13.37	5.93E-08	2.1
565	153.03	38.35	4.38E-08	2.6
580	146.82	14.19	3.51E-08	3.4

SPECIMEN 070401

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
0	337.31	68.00	7.16E-07	2.4
2	340.39	68.05	7.11E-07	2.4
5	335.29	68.87	7.03E-07	2.3
10	337.00	68.67	6.92E-07	2.3
15	338.53	68.35	6.83E-07	2.3
20	338.50	68.43	6.79E-07	2.5
25	339.41	68.53	6.69E-07	2.7
30	338.30	68.31	6.62E-07	2.3
50	338.17	68.31	6.64E-07	2.3
75	336.68	67.86	6.64E-07	2.5
110	165.07	22.94	8.98E-08	3.3
260	161.71	14.30	8.00E-08	3.2
305	165.37	13.43	6.53E-08	2.9
350	169.19	18.45	5.24E-08	2.2
450	166.95	2.49	2.70E-08	2.9
505	167.12	10.23	1.62E-08	3.1
520	185.53	29.48	2.00E-08	2.7
550	293.63	-60.09	9.74E-09	12.2

SPECIMEN 070501

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
0	317.36	71.19	2.62E-06	2.5
110	162.54	7.21	4.82E-07	2.7
260	163.16	0.93	3.56E-07	2.2
305	153.67	2.51	3.43E-07	3.1
350	161.61	5.01	2.66E-07	2.3
450	158.42	11.29	1.28E-07	2.5
505	162.47	23.40	7.84E-08	2.2
520	161.96	25.69	8.46E-08	1.7
535	167.92	22.42	8.69E-08	2.4
550	161.32	14.36	5.86E-08	2.8
565	165.20	25.10	4.41E-08	3.6
580	177.21	21.55	3.90E-08	4.1

SPECIMEN 070601

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
0	148.68	79.00	1.31E-07	1.0
5	163.34	71.07	1.18E-07	0.8
10	188.61	51.04	1.13E-07	1.6
15	186.94	43.08	9.98E-08	2.2
20	186.41	38.92	9.96E-08	1.7
110	170.23	16.86	1.06E-07	1.7
260	166.68	4.10	8.64E-08	2.1
305	173.03	7.34	5.33E-08	1.7
350	167.96	0.95	5.04E-08	2.5
450	170.05	1.13	2.00E-08	2.0
505	151.72	-45.59	3.07E-08	3.4
520	111.94	51.75	2.65E-08	2.4
535	156.08	80.91	2.98E-08	2.2
550	13.03	31.60	1.59E-08	2.3

SPECIMEN 080101

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	343.07	47.73	2.47E-07	2.8
5	353.59	39.92	1.70E-07	2.6
10	350.06	16.88	1.15E-07	2.6
15	350.61	-11.07	9.74E-08	2.4
20	357.18	-19.46	7.22E-08	2.4
110	11.94	-71.39	1.16E-07	1.3
110	13.26	-70.94	1.16E-07	0.7
260	52.61	-83.46	1.45E-07	0.9
305	40.71	-82.37	1.31E-07	0.7
350	135.72	-83.74	9.41E-08	1.3
450	181.81	-32.28	1.86E-08	2.3
505	130.34	-52.30	8.76E-08	2.9
520	239.63	-65.65	2.72E-08	1.9
535	261.25	69.81	4.99E-08	1.6
550	223.83	-28.66	5.32E-08	2.8

SPECIMEN 080201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	173.96	56.84	1.04E-07	1.3
5	173.19	48.31	9.52E-08	1.7
10	177.44	34.40	8.87E-08	1.6
15	176.84	23.44	8.27E-08	1.7
20	175.61	21.02	8.57E-08	1.9
110	173.67	-11.83	1.17E-07	2.0
260	170.01	-17.26	1.28E-07	2.2
305	170.64	-18.63	1.16E-07	2.3
350	176.60	-15.15	1.01E-07	1.9
450	180.38	-7.45	7.19E-08	1.7
505	179.08	-9.45	5.39E-08	2.0
520	144.87	-30.68	2.22E-07	3.1
520	145.39	-30.46	2.22E-07	3.1
535	177.63	-19.33	5.15E-08	2.0
550	203.41	0.84	3.61E-08	3.2
565	185.15	-1.48	3.32E-08	2.6
580	174.21	-20.47	7.00E-08	1.7

SPECIMEN 080301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	64.78	75.33	1.24E-07	1.6
5	85.89	68.43	9.25E-08	1.3
10	95.25	63.65	6.89E-08	1.2
15	98.82	54.98	5.07E-08	1.4
20	128.30	63.68	2.83E-08	0.6
110	167.22	-33.62	8.69E-08	4.2
260	165.66	-36.24	1.01E-07	3.3
305	166.11	-31.52	8.37E-08	3.8
350	170.89	-27.93	7.26E-08	4.1
450	179.64	-22.54	5.96E-08	3.2
505	157.39	-19.59	3.43E-08	3.2
505	178.57	-21.05	3.19E-08	3.0
520	167.82	-20.71	3.71E-08	3.5
535	163.65	-11.69	5.25E-08	3.4
550	202.77	-11.32	2.88E-08	1.9
565	133.96	-40.34	5.40E-08	2.4

SPECIMEN 080401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	174.00	45.89	3.29E-07	1.1
5	174.66	43.21	3.21E-07	1.3
10	172.80	38.64	3.08E-07	1.4
15	173.78	35.95	2.93E-07	1.7
20	173.00	34.30	2.89E-07	1.8
110	168.61	8.03	3.00E-07	2.5
260	164.93	-0.54	2.84E-07	2.7
305	165.51	-1.41	2.45E-07	2.6
350	170.25	-1.50	2.15E-07	2.7
450	179.40	-5.74	1.35E-07	2.0
505	163.47	-6.37	9.30E-08	3.1
520	173.68	-4.18	7.27E-08	2.2
535	162.66	-6.35	7.58E-08	2.7
550	172.42	-12.61	6.77E-08	2.6
565	167.32	-9.09	6.22E-08	2.5
580	151.40	-11.93	8.11E-08	3.6

SPECIMEN 090101

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	195.03	68.41	4.18E-07	1.4
5	188.75	65.20	3.87E-07	1.1
10	187.77	64.21	3.50E-07	1.2
15	187.44	63.66	3.30E-07	1.4
20	186.13	63.12	3.24E-07	1.3
110	165.92	-29.17	3.76E-07	3.7
260	162.03	-31.92	3.68E-07	3.5
305	159.45	-34.00	3.09E-07	3.8
350	163.98	-36.58	2.19E-07	3.4
450	168.23	-38.62	1.00E-07	3.5
505	168.87	-48.87	4.56E-08	3.5
520	163.25	-44.21	4.01E-08	3.3
535	147.51	-50.78	3.58E-08	3.2
550	136.25	-46.67	5.82E-08	3.0
565	127.97	-65.56	2.31E-08	5.3
580	199.24	-62.06	3.06E-08	4.9

SPECIMEN 090201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	359.21	-10.63	8.38E-07	2.9
5	1.95	-16.48	8.25E-07	2.7
10	2.02	-22.37	8.21E-07	2.7
15	1.12	-24.22	7.83E-07	2.4
20	3.61	-26.32	7.06E-07	2.3
110	10.35	-45.50	7.41E-07	1.5
260	10.74	-48.18	7.41E-07	1.2
305	12.49	-48.53	7.08E-07	1.4
350	7.24	-47.04	6.17E-07	1.6
450	11.09	-50.14	2.15E-07	1.1
505	3.50	-69.85	6.94E-08	0.8
520	68.15	-68.64	4.05E-08	1.3
535	79.70	-71.36	3.84E-08	1.4
550	136.58	-43.41	3.02E-08	2.7
565	155.89	-22.72	2.10E-08	4.4
580	154.56	-40.61	1.78E-08	3.9

SPECIMEN 090302

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	357.33	18.15	3.98E-07	1.8
2	357.99	16.31	3.92E-07	1.8
5	359.78	7.53	3.53E-07	1.6
10	359.97	-13.44	3.09E-07	1.5
15	358.74	-15.26	3.00E-07	1.8
20	358.95	-17.45	2.76E-07	1.6
25	357.20	-18.24	2.42E-07	1.4
30	0.24	-15.28	2.12E-07	1.6
40	359.47	-11.81	1.77E-07	1.6
50	358.24	-3.67	1.31E-07	1.6
60	6.47	22.43	1.01E-07	1.6
75	354.69	38.35	9.66E-08	2.4
90	359.87	50.96	8.81E-08	2.7
105	16.89	74.74	1.05E-07	2.2
120	334.26	73.06	1.10E-07	2.6
135	1.05	74.74	1.04E-07	2.6
150	36.14	84.82	1.15E-07	2.1
110	153.22	-12.40	6.63E-08	2.8
260	144.52	-15.85	6.59E-08	3.3
305	147.83	-17.73	5.60E-08	3.5
350	164.52	-27.02	4.63E-08	2.3
450	159.58	-34.58	3.00E-08	3.3
505	198.81	-3.13	3.87E-08	4.3
520	180.49	-39.40	2.68E-08	2.2
535	231.30	40.48	1.45E-08	3.7
550	152.79	2.61	1.13E-08	6.2

SPECIMEN 090401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	21.80	59.79	1.49E-07	2.1
5	49.62	40.87	7.91E-08	1.8
10	69.71	-37.71	5.58E-08	1.6
15	87.37	-64.78	9.00E-08	2.4
20	112.44	-60.14	1.02E-07	3.7
25	135.60	-58.06	1.03E-07	3.4
30	142.81	-51.40	1.04E-07	3.6
40	149.81	-41.00	1.02E-07	4.0
50	158.80	-28.19	1.11E-07	3.3
60	158.08	-12.90	1.16E-07	2.9
75	162.28	-7.72	1.23E-07	2.4
90	170.54	-2.91	1.38E-07	2.1
105	163.80	3.80	1.47E-07	2.1
120	166.14	4.29	1.40E-07	2.4
135	168.39	2.62	1.50E-07	2.0
110	167.51	-9.01	1.71E-07	2.4
260	165.67	-10.13	1.69E-07	2.2
305	166.74	-11.66	1.47E-07	2.2
350	171.27	-13.90	1.21E-07	2.0
450	164.08	-24.18	6.67E-08	2.2
505	173.57	-14.97	3.36E-08	2.1
520	200.45	-51.92	1.86E-08	4.2
535	142.57	41.51	1.14E-08	6.4
550	202.18	-18.07	1.89E-08	4.7

SPECIMEN 090501

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	157.17	15.95	3.74E-07	2.3
2	159.70	13.94	3.78E-07	1.8
5	156.73	2.28	4.10E-07	2.1
10	155.51	-8.61	4.24E-07	2.5
15	157.63	-13.95	4.34E-07	2.7
20	157.60	-15.15	4.53E-07	2.3
25	158.74	-15.86	4.65E-07	2.2
30	158.25	-15.44	4.68E-07	2.1
40	161.08	-14.46	4.72E-07	2.0
50	160.37	-14.01	4.74E-07	2.1
60	160.41	-11.55	4.85E-07	2.0
75	162.00	-11.50	4.86E-07	1.9
90	161.92	-11.50	4.88E-07	1.9
110	157.92	-15.34	5.18E-07	2.2
260	156.14	-18.01	4.76E-07	2.4
305	155.86	-17.68	3.82E-07	2.4
350	159.57	-17.91	3.32E-07	2.2
450	163.49	-14.96	1.65E-07	1.8
505	152.44	-13.01	9.73E-08	2.5
520	159.83	-14.20	7.47E-08	1.8
535	159.73	-12.29	4.71E-08	2.2
550	150.24	-31.74	3.17E-08	3.4
565	109.10	-15.86	5.34E-08	2.5
580	187.81	-17.32	7.72E-08	4.5

SPECIMEN 120201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	165.13	16.15	1.08E-06	2.1
2	163.66	14.93	1.07E-06	2.0
5	165.14	15.09	1.07E-06	2.0
10	164.85	14.34	1.07E-06	2.1
15	166.89	14.80	1.06E-06	2.3
20	164.95	14.47	1.06E-06	2.2
30	164.14	13.25	1.06E-06	2.4
50	158.72	11.17	1.06E-06	2.3
60	160.93	11.85	1.07E-06	2.3
75	161.40	12.12	1.06E-06	2.6
110	156.17	-10.79	1.25E-06	3.0
260	157.24	-12.18	1.13E-06	3.2
305	216.79	-76.56	2.23E-06	2.1
305	140.44	44.38	2.49E-06	1.8
350	165.05	-8.75	8.57E-07	2.2
450	285.11	-73.32	2.09E-06	0.7
505	160.39	-6.37	2.52E-07	2.2
520	167.90	-5.79	2.18E-07	1.9
535	170.72	-2.94	1.84E-07	2.6
550	161.86	-10.10	1.20E-07	3.4
565	162.76	-5.89	1.10E-07	3.4
580	179.54	-8.92	1.12E-07	3.8

SPECIMEN 120202

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	167.97	13.01	1.39E-06	1.7
5	166.40	12.51	1.39E-06	1.8
10	168.08	12.89	1.39E-06	1.8
110	166.41	-6.77	1.58E-06	2.4
260	162.81	-10.19	1.36E-06	2.3
305	165.38	-9.15	1.26E-06	2.5
350	169.03	-7.65	1.09E-06	2.0
450	164.27	-6.03	4.42E-07	2.2
505	164.17	-5.57	2.76E-07	2.3
520	168.03	-7.25	1.87E-07	2.4
535	164.67	-6.47	1.65E-07	2.5
550	174.11	-16.56	1.04E-07	3.9
565	172.13	-25.11	1.04E-07	3.7
580	189.12	-27.95	9.46E-08	4.6

SPECIMEN 120402

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	17.89	79.93	2.93E-07	2.2
2	8.79	82.05	2.84E-07	2.0
5	10.77	82.10	2.64E-07	2.1
10	17.11	83.46	2.49E-07	2.0
15	28.36	82.95	2.34E-07	2.2
20	38.18	83.49	2.21E-07	1.8
25	27.56	83.24	2.21E-07	2.0
30	30.38	84.04	2.21E-07	2.0
40	4.88	86.63	2.32E-07	1.9
40	61.06	84.74	2.07E-07	1.9
50	46.03	85.87	1.92E-07	2.1
60	22.36	86.18	2.07E-07	2.0
110	146.00	3.36	8.81E-08	2.6
260	150.00	-3.34	9.17E-08	2.7
305	146.14	1.66	7.22E-08	2.8
350	163.95	-2.41	9.54E-08	1.6
450	219.03	36.60	1.82E-08	3.5
505	124.10	22.12	2.15E-08	3.1
520	199.75	22.69	9.65E-09	6.4
535	54.07	-58.17	1.96E-07	1.7
550	321.90	-75.58	1.84E-08	6.0

SPECIMEN 120501

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	31.50	86.45	4.14E-07	1.6
5	78.30	86.88	3.57E-07	1.2
10	136.76	84.08	2.82E-07	1.0
15	142.82	77.83	2.00E-07	0.5
20	139.38	69.95	1.71E-07	0.4
110	135.42	40.06	1.36E-07	1.9
260	148.85	5.63	1.20E-07	2.9
305	148.09	-0.50	1.22E-07	3.0
350	156.69	9.40	6.04E-08	2.3
450	50.82	-57.16	1.61E-08	1.9
450	52.76	-59.23	1.58E-08	1.9
505	334.76	-42.76	1.74E-08	3.2
520	293.63	-67.95	2.86E-08	3.7
535	86.76	-8.83	3.10E-08	2.1
550	163.31	11.24	1.06E-07	2.3

SPECIMEN 120701

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	176.05	42.66	4.74E-07	1.6
5	176.16	42.42	4.75E-07	1.9
10	175.23	41.49	4.74E-07	1.9
110	162.56	-6.10	5.54E-07	2.3
260	161.44	-9.55	5.02E-07	2.1
305	160.42	-10.04	4.46E-07	2.4
350	158.32	-9.82	3.70E-07	2.6
450	165.35	-5.78	1.97E-07	2.0
505	182.74	-10.00	1.99E-07	2.7
520	166.19	-5.14	9.21E-08	2.3
535	169.23	-3.74	8.73E-08	2.5
550	191.89	-29.82	4.57E-08	6.1
565	166.12	-28.75	3.10E-08	6.5
580	174.20	-22.38	3.04E-08	7.1

SPECIMEN 130101

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	183.16	69.99	4.78E-07	0.7
5	182.86	66.97	4.42E-07	0.7
10	183.29	62.45	3.91E-07	1.0
15	182.06	58.63	3.54E-07	1.0
20	184.21	55.40	3.45E-07	1.2
110	172.30	-17.68	3.66E-07	2.7
260	165.15	-20.90	3.81E-07	1.6
305	171.59	-23.47	3.57E-07	1.8
350	166.43	-22.88	3.18E-07	1.9
450	182.27	-28.42	1.91E-07	2.7
505	178.80	-23.87	1.94E-07	2.3
520	175.88	-31.92	1.50E-07	2.4
535	166.66	-30.66	1.48E-07	1.6
550	179.85	-33.31	1.21E-07	2.5
565	180.31	-27.62	1.41E-07	2.5
580	177.36	-30.54	1.35E-07	2.5

SPECIMEN 130201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	163.56	34.24	5.74E-07	3.0
2	160.12	32.21	5.70E-07	2.7
5	161.07	25.74	5.67E-07	3.7
10	162.58	16.79	5.57E-07	3.6
15	160.36	8.32	5.53E-07	3.7
20	161.40	4.49	5.67E-07	4.5
25	160.40	1.95	5.68E-07	3.8
30	162.10	-1.36	5.63E-07	4.3
40	165.87	-2.80	5.47E-07	3.8
50	163.73	-5.23	5.31E-07	4.2
60	166.40	-7.25	5.13E-07	3.7
75	170.98	-9.05	4.86E-07	3.6
90	173.61	-10.71	4.91E-07	3.4
110	166.10	-16.93	5.48E-07	4.0
260	169.36	-17.70	5.06E-07	3.7
305	163.08	-18.03	4.68E-07	3.8
350	171.68	-19.53	4.01E-07	3.3
450	160.62	-21.99	2.68E-07	4.3
505	169.14	-23.13	1.89E-07	3.3
520	172.71	-22.61	1.98E-07	2.8
535	182.68	-23.31	1.83E-07	2.8
550	171.34	-17.94	1.82E-07	3.3
565	182.58	-25.60	1.69E-07	2.9
580	168.74	-19.70	1.43E-07	3.5

SPECIMEN 130301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	172.14	9.34	2.47E-07	3.0
5	176.72	2.62	2.71E-07	2.7
10	177.48	-0.94	2.72E-07	2.4
15	176.66	-6.68	2.81E-07	3.0
20	180.13	-8.32	2.83E-07	2.3
110	178.03	-17.24	3.18E-07	3.3
260	172.18	-21.58	3.17E-07	3.4
305	173.82	-22.65	3.03E-07	2.9
350	175.71	-24.47	2.49E-07	2.6
450	175.35	-29.47	1.83E-07	2.5
505	213.90	-38.05	2.58E-07	2.2
520	177.83	-24.35	1.47E-07	2.0
535	171.20	-27.49	1.32E-07	2.1
550	168.93	-33.60	1.22E-07	1.7
565	172.11	-26.66	1.05E-07	1.9
580	173.20	-30.78	1.08E-07	1.4

SPECIMEN 130401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	175.02	2.41	3.05E-07	2.9
2	176.60	1.85	3.00E-07	2.6
5	176.73	1.13	3.00E-07	2.6
10	176.21	0.07	2.97E-07	2.7
15	175.04	-1.62	2.98E-07	2.5
20	175.96	-2.39	2.93E-07	2.7
25	175.54	-4.16	3.00E-07	2.5
30	174.34	-4.38	3.07E-07	2.5
40	179.12	-5.80	3.02E-07	2.5
50	179.06	-6.70	3.02E-07	2.5
60	174.91	-6.78	3.10E-07	2.7
90	177.96	-5.90	3.17E-07	2.3
110	170.30	-15.73	3.67E-07	2.7
260	176.25	-18.74	3.45E-07	2.6
305	171.33	-18.33	3.25E-07	2.4
350	178.29	-18.41	2.98E-07	2.1
450	171.34	-21.80	2.11E-07	2.8
505	171.88	-19.41	1.85E-07	2.1
520	176.34	-23.35	1.82E-07	2.1
535	172.60	-25.79	1.81E-07	2.1
550	175.19	-25.81	1.49E-07	2.3
565	173.62	-23.03	1.15E-07	2.2
580	183.35	-33.61	1.33E-07	1.6

SPECIMEN 130501

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	228.64	-8.52	1.62E-06	3.3
5	226.43	-8.89	1.63E-06	3.4
10	226.18	-9.43	1.61E-06	3.5
110	223.84	-10.23	1.59E-06	3.7
260	219.36	-13.29	1.49E-06	3.5
305	219.81	-13.42	1.28E-06	3.9
350	222.08	-13.61	1.26E-06	4.0
450	222.89	-12.47	1.11E-06	3.6
505	217.15	60.44	2.19E-06	1.8
505	220.85	-13.78	9.30E-07	3.3
520	224.28	-13.87	8.75E-07	3.2
535	215.74	-14.69	8.07E-07	4.0
550	218.94	-14.17	7.86E-07	3.7
565	223.82	-14.83	6.87E-07	3.5
580	225.75	-15.87	6.96E-07	2.9

SPECIMEN 140201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	161.11	72.28	1.52E-07	0.7
2	161.41	68.16	1.43E-07	0.9
5	161.59	65.84	1.40E-07	0.9
10	161.85	63.97	1.35E-07	0.9
15	162.42	62.22	1.29E-07	1.2
20	160.58	61.12	1.28E-07	1.1
25	164.00	60.41	1.26E-07	1.3
30	164.75	59.43	1.25E-07	1.2
40	164.49	59.67	1.22E-07	1.3
50	169.62	57.90	1.20E-07	1.3
60	169.65	57.28	1.20E-07	1.4
90	169.95	57.57	1.18E-07	1.5
110	168.82	-0.99	1.32E-07	3.3
260	166.20	-3.37	1.23E-07	2.8
305	165.15	-3.62	1.11E-07	3.1
350	171.91	-2.41	1.10E-07	2.7
450	164.78	-2.51	7.06E-08	3.4
505	165.52	-10.26	5.37E-08	2.9
520	163.19	-13.76	4.24E-08	3.0
535	226.99	8.24	8.64E-08	2.3
535	228.54	10.46	8.49E-08	2.5
550	163.81	17.97	4.36E-08	3.9
565	173.56	0.63	4.00E-08	4.4
580	199.19	-75.42	3.08E-08	7.4

SPECIMEN 140401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	24.41	72.40	1.20E-07	2.7
5	23.94	75.72	9.30E-08	2.6
10	29.08	69.93	6.72E-08	3.2
15	31.81	61.02	4.42E-08	3.9
20	38.83	65.55	3.27E-08	4.5
110	62.50	66.39	2.68E-08	4.5
260	139.67	-32.20	1.76E-08	3.6
305	139.36	-32.13	1.99E-08	2.6
350	149.12	-30.36	1.11E-08	3.9
505	205.86	54.14	5.13E-08	2.1
505	205.69	53.71	5.14E-08	2.0
520	262.37	73.67	2.08E-08	10.1
535	59.34	-46.17	1.13E-07	4.7
535	62.19	-46.42	1.11E-07	4.8
550	179.18	-74.92	1.23E-08	10.2

SPECIMEN 140601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	179.21	-8.75	3.56E-07	1.8
110	179.83	-14.45	3.91E-07	1.7
260	179.23	-16.71	3.94E-07	1.5
305	180.87	-16.60	3.64E-07	1.7
350	184.16	-21.05	3.58E-07	1.8
450	178.49	-11.61	2.77E-07	1.6
505	178.55	-14.50	2.00E-07	1.5
520	167.64	-26.14	1.92E-07	0.9
535	179.95	-21.43	1.87E-07	1.5
550	183.72	-7.46	1.56E-07	1.4
565	179.77	-9.40	1.65E-07	1.9
580	181.09	-19.56	1.47E-07	1.1

SPECIMEN 140701

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	167.59	10.07	1.50E-07	2.3
2	168.56	8.45	1.51E-07	3.0
5	169.06	4.58	1.54E-07	2.9
10	166.94	-0.15	1.54E-07	2.9
15	166.61	-4.48	1.54E-07	2.8
20	167.34	-6.20	1.55E-07	3.2
25	167.01	-7.85	1.55E-07	2.9
30	165.82	-9.35	1.55E-07	3.0
40	165.94	-10.05	1.56E-07	2.8
50	168.26	-11.07	1.56E-07	2.9
60	165.39	-10.60	1.56E-07	2.8
90	169.46	-11.46	1.57E-07	2.8
110	169.60	-13.74	1.63E-07	3.4
260	164.41	-16.09	1.51E-07	2.5
305	162.98	-15.14	1.43E-07	2.4
350	172.93	-19.18	1.16E-07	2.2
450	165.24	-17.84	7.29E-08	2.2
505	165.17	-23.92	5.27E-08	2.5
520	179.22	-7.91	4.27E-08	4.8
535	25.00	-27.87	1.40E-07	3.5
535	24.87	-27.21	1.40E-07	3.6
550	122.09	-48.33	3.96E-08	3.1
565	110.35	-62.30	3.50E-08	5.8
580	67.92	12.72	2.66E-08	5.1

SPECIMEN 150301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	341.35	64.76	2.73E-07	2.0
5	343.78	64.55	2.69E-07	2.0
10	343.74	64.24	2.60E-07	2.2
110	157.58	28.89	1.93E-08	6.3
260	166.39	-26.03	2.95E-08	4.6
305	185.13	-42.54	3.09E-08	5.1
350	184.03	-32.03	2.13E-08	5.6
450	131.65	-53.39	1.73E-08	5.4
505	330.95	-38.59	1.71E-07	6.2
505	335.95	-35.13	1.60E-07	6.4
520	359.50	-56.61	2.12E-07	6.2
535	313.22	-34.22	1.27E-07	9.0
550	3.58	-40.63	2.39E-07	6.6

SPECIMEN 160301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	171.65	43.11	1.94E-07	2.2
5	161.59	41.32	1.75E-07	1.8
10	157.78	41.01	1.56E-07	1.7
15	150.89	38.80	1.57E-07	1.8
20	141.09	28.61	1.51E-07	2.0
110	143.84	27.83	1.63E-07	2.8
260	136.12	19.10	1.36E-07	2.3
305	141.75	17.84	1.34E-07	2.7
350	151.29	14.93	1.41E-07	2.6
450	156.70	-10.09	9.26E-08	2.6
505	208.34	1.96	1.31E-07	6.3
520	306.85	-50.63	6.74E-08	13.0
535	52.58	-25.93	4.16E-08	10.3
550	342.16	-63.42	7.23E-08	12.6

SPECIMEN 170102

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	194.27	59.30	8.64E-07	2.6
2	194.38	57.21	8.39E-07	2.3
5	179.46	44.16	8.03E-07	2.2
10	179.73	49.31	6.67E-07	1.8
15	181.46	41.62	5.45E-07	2.3
20	163.94	25.58	5.36E-07	2.0
25	163.44	27.34	4.67E-07	1.8
30	168.36	21.39	4.17E-07	2.2
40	171.69	24.73	3.71E-07	2.3
50	173.72	24.40	3.30E-07	1.9
60	173.20	15.08	3.00E-07	2.2
75	178.89	14.61	2.04E-07	2.7
90	188.00	27.98	1.77E-07	3.1
90	197.92	10.57	1.29E-07	4.0
110	205.27	17.52	1.14E-07	5.6
260	198.91	9.23	1.13E-07	4.8
305	190.12	3.35	1.31E-07	4.0
350	209.76	9.88	1.11E-07	4.7
450	213.07	20.92	1.35E-07	4.0
505	226.34	15.56	1.02E-07	4.9
520	226.61	-2.31	1.64E-07	4.4
535	241.52	15.79	3.31E-07	3.5
550	289.74	-15.70	1.48E-07	10.2
565	294.27	-27.30	1.46E-07	12.9
580	175.97	7.38	1.22E-06	2.4

SPECIMEN 170301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	142.30	47.95	1.97E-07	2.0
5	145.89	43.69	1.87E-07	2.0
10	148.20	38.63	1.74E-07	2.1
15	150.44	35.46	1.51E-07	2.3
20	146.06	36.00	1.44E-07	2.3
110	145.58	33.80	1.42E-07	2.8
260	138.49	23.89	1.36E-07	2.7
305	139.29	25.93	1.37E-07	2.6
350	151.48	7.49	8.72E-08	3.5
450	157.42	12.94	9.41E-08	3.7
505	182.79	51.72	1.13E-07	6.0
520	138.73	20.62	6.10E-08	10.9
535	245.57	0.24	3.51E-07	4.5
535	245.16	4.47	3.30E-07	4.4
550	309.98	-47.85	1.03E-07	15.1

SPECIMEN 170601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	191.94	53.12	4.89E-07	2.5
5	183.75	47.39	4.70E-07	2.3
10	180.64	45.34	4.37E-07	2.4
15	184.68	33.51	3.88E-07	2.8
20	166.78	30.57	3.83E-07	2.3
110	178.51	30.70	3.78E-07	3.3
260	167.01	22.44	3.50E-07	2.4
305	171.93	21.38	3.44E-07	3.2
350	173.50	12.45	3.14E-07	3.1
450	176.23	2.53	2.82E-07	3.3
505	183.38	-9.09	3.27E-07	4.2
520	222.92	-14.91	1.82E-07	7.5
535	245.03	33.51	4.66E-07	3.6
550	222.48	-34.52	2.02E-07	10.0
565	245.81	-60.50	2.86E-07	9.9
580	333.07	56.25	8.79E-07	3.4

SPECIMEN 180301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	154.77	18.98	1.61E-06	3.4
110	153.80	13.86	1.57E-06	3.2
260	149.41	9.16	1.37E-06	3.6
305	142.55	11.09	1.17E-06	3.5
350	148.54	11.46	1.04E-06	3.0
450	346.87	-83.81	1.65E-06	1.1
505	148.08	23.07	4.52E-07	2.8
520	152.81	19.59	4.46E-07	2.3
535	150.72	15.82	3.85E-07	2.9
550	151.64	10.20	3.70E-07	2.6
565	143.52	11.92	3.33E-07	3.7
580	150.63	11.68	2.86E-07	2.7

SPECIMEN 180401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	149.91	16.65	2.31E-06	2.9
110	152.00	12.56	2.29E-06	3.4
260	155.75	-53.43	2.02E-06	3.3
305	156.35	10.61	1.78E-06	3.1
350	154.69	13.58	1.49E-06	3.6
450	165.65	19.98	9.90E-07	2.6
505	162.47	20.99	6.10E-07	2.8
520	164.67	20.77	5.19E-07	2.3
535	153.78	18.37	5.09E-07	2.5
550	164.15	20.00	3.35E-07	2.7
565	161.86	21.54	2.96E-07	2.4
580	165.07	19.73	3.03E-07	2.4

SPECIMEN 180501

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	156.65	28.84	1.35E-06	2.5
2	157.24	28.49	1.36E-06	2.2
5	158.76	27.90	1.37E-06	2.1
10	154.26	24.84	1.41E-06	2.4
15	158.84	24.82	1.44E-06	2.2
20	155.97	19.61	1.41E-06	2.8
25	162.31	20.83	1.42E-06	2.5
30	161.74	19.19	1.38E-06	2.3
40	157.92	24.30	1.42E-06	2.2
50	152.30	20.04	1.38E-06	2.5
75	150.94	16.19	1.46E-06	2.7
110	136.17	11.83	1.46E-06	3.3
260	155.66	-67.66	1.94E-06	2.5
305	141.11	13.71	1.10E-06	3.6
350	146.55	16.73	9.58E-07	3.3
450	272.41	-88.47	1.96E-06	1.1
505	139.83	12.75	4.97E-07	3.4
520	143.79	11.08	5.05E-07	3.1
535	136.34	13.61	3.89E-07	3.6
550	145.27	18.39	3.14E-07	3.0
565	153.68	26.30	2.20E-07	3.0
580	148.37	23.35	1.87E-07	2.5

SPECIMEN 180601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	134.53	33.82	9.79E-07	1.7
110	134.63	23.69	9.44E-07	2.3
260	131.28	15.18	7.76E-07	2.3
305	129.04	26.44	5.71E-07	1.8
350	126.41	27.35	4.79E-07	2.0
450	84.03	49.19	3.88E-07	1.4
505	85.33	52.68	3.56E-07	1.2
520	65.54	71.29	3.13E-07	2.8
535	335.24	-65.57	1.93E-06	0.4
535	17.40	68.47	2.72E-07	3.0
550	274.26	69.34	1.52E-07	2.8
565	34.69	72.60	1.96E-07	3.1
580	17.63	63.41	1.68E-07	3.4

SPECIMEN 190401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	38.09	47.86	2.34E-07	2.6
5	44.49	47.08	1.58E-07	2.7
10	49.73	48.44	9.07E-08	2.6
15	49.12	44.80	9.17E-08	2.5
20	62.82	37.01	8.39E-08	2.2
110	73.88	31.32	8.39E-08	2.0
260	80.16	11.41	7.40E-08	2.2
305	88.25	25.22	6.96E-08	2.3
350	71.24	-17.90	4.19E-08	2.6
450	339.21	-46.36	5.11E-08	10.2
505	290.14	-33.14	6.13E-08	10.0
520	352.23	-60.74	8.71E-08	7.9
535	139.33	-51.31	7.61E-08	8.4
550	336.72	-49.44	1.49E-07	10.1

SPECIMEN 200201

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
0	262.88	72.40	1.55E-07	2.5
110	307.14	55.98	6.24E-08	3.4
260	336.43	-31.82	3.46E-08	4.0
305	333.14	-46.94	3.25E-08	4.0
350	31.39	-48.46	1.59E-08	3.6
450	90.31	-47.41	1.76E-08	2.8
505	12.90	-34.91	6.43E-09	6.3
520	190.39	-8.91	2.27E-08	1.7
535	258.10	55.55	1.30E-08	6.0
550	17.62	44.17	9.19E-09	9.4

SPECIMEN 200301

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
0	137.41	80.23	1.70E-07	1.0
110	158.57	47.65	1.15E-07	2.0
260	157.21	-1.77	1.05E-07	2.5
305	162.65	-1.42	8.77E-08	2.7
350	170.45	-6.19	8.51E-08	2.3
450	171.21	11.95	5.36E-08	2.3
505	178.79	32.23	3.91E-08	2.6
520	158.52	16.09	2.36E-08	2.7
535	159.31	42.08	5.35E-08	4.3
550	191.63	38.59	2.60E-08	3.9
565	105.78	57.71	1.92E-08	4.4

SPECIMEN 200501

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
0	171.99	49.19	1.91E-07	1.8
110	160.28	23.73	1.77E-07	2.2
260	155.54	3.35	1.77E-07	2.3
305	158.40	2.80	1.61E-07	2.2
350	159.93	7.79	1.57E-07	1.8
450	166.79	-13.88	1.06E-07	2.1
505	168.09	2.74	7.15E-08	2.0
520	153.69	1.71	8.42E-08	3.4
535	163.19	12.45	6.70E-08	1.8
550	155.99	-2.63	5.24E-08	2.0
565	152.14	-9.08	4.41E-08	2.7
580	155.10	-6.31	6.20E-08	2.4

SPECIMEN 200603

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
0	167.40	29.97	2.55E-07	2.0
2	166.74	28.52	2.56E-07	1.7
5	166.41	25.66	2.58E-07	1.9
10	167.36	21.38	2.62E-07	1.5
20	169.65	21.66	2.56E-07	1.5
30	168.62	19.81	2.49E-07	1.7
50	172.31	19.97	2.58E-07	1.6
75	172.46	16.33	2.61E-07	2.1
110	164.74	-3.06	2.95E-07	2.2
260	166.22	-3.90	2.84E-07	1.8
305	167.18	-3.94	2.73E-07	2.1
350	173.00	-2.33	2.38E-07	2.1
450	164.54	1.49	1.86E-07	1.6
505	169.66	2.42	1.67E-07	1.8
520	171.89	4.66	1.64E-07	1.4
535	169.92	34.41	2.07E-07	2.2
550	167.16	5.98	1.24E-07	2.0
565	171.90	-1.06	1.61E-07	1.9
580	168.95	6.57	1.15E-07	1.7

SPECIMEN 210101

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	264.51	63.24	1.37E-07	3.2
110	232.78	52.58	7.64E-08	2.8
260	176.05	-19.53	5.41E-08	2.2
305	168.48	-31.24	4.49E-08	2.7
350	161.42	-26.67	4.71E-08	2.4
450	159.23	-20.27	2.41E-08	2.8
505	320.94	-23.56	1.69E-08	5.7
520	205.70	-26.10	2.89E-08	2.9
535	309.75	16.60	1.55E-07	3.2
535	309.47	16.98	1.55E-07	3.2
550	44.06	57.65	1.58E-08	5.3

SPECIMEN 210201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	156.39	21.51	9.14E-08	2.1
110	156.65	1.96	9.66E-08	2.1
260	153.58	-22.35	1.10E-07	2.2
305	150.29	-26.89	9.47E-08	2.6
350	158.56	-25.00	7.87E-08	2.2
450	143.03	-65.28	4.48E-08	3.5
505	164.91	-21.89	2.71E-08	2.2
520	179.39	-14.20	1.60E-08	4.4
535	165.38	-46.76	3.61E-08	3.8
550	200.05	-16.28	2.27E-08	3.2
565	144.95	-38.99	3.36E-08	2.9
580	126.48	-15.49	3.18E-08	3.0

SPECIMEN 210301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	154.96	9.69	4.02E-07	2.1
110	152.91	-1.83	4.13E-07	2.2
260	150.09	-12.62	3.89E-07	3.2
305	157.62	-11.73	3.15E-07	2.3
350	162.83	-8.92	3.04E-07	1.9
450	160.75	-10.95	1.91E-07	2.2
505	170.20	-13.29	1.26E-07	2.1
520	163.70	-17.44	1.32E-07	1.7
535	276.92	-13.60	7.33E-08	4.1
550	179.18	-1.40	9.93E-08	2.8
565	174.85	-16.72	8.47E-08	2.2
580	168.93	-1.21	4.22E-08	4.6

SPECIMEN 220501

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
0	121.87	50.67	1.78E-07	2.5
80	109.47	32.43	1.48E-07	1.4
105	105.15	14.32	1.24E-07	5.5
200	124.25	-0.40	9.47E-08	1.9
305	136.61	-17.48	5.43E-08	1.7
350	164.97	0.32	2.39E-08	4.2
450	110.78	58.57	2.25E-08	2.5
505	159.87	11.30	1.57E-08	4.6
520	22.68	26.08	2.46E-08	5.0
535	319.24	33.01	1.44E-08	7.8
550	43.48	60.06	2.68E-08	4.5
565	129.43	70.93	4.15E-08	3.7
580	19.92	79.43	2.16E-08	7.5

SPECIMEN 220601

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
0	161.51	38.45	2.76E-07	4.2
80	158.51	27.91	2.66E-07	3.3
105	172.98	15.79	2.83E-07	3.3
200	164.11	-1.37	2.89E-07	3.3
305	159.64	-0.92	1.91E-07	2.8
350	148.86	13.30	5.45E-08	11.6
450	160.37	14.31	5.63E-08	3.6
505	137.79	-0.23	2.67E-08	3.8
520	198.82	56.71	2.72E-08	8.8
535	67.54	11.09	5.24E-08	3.5
550	158.28	51.81	2.51E-08	6.3
565	248.14	76.55	4.87E-08	4.2
580	202.95	-2.00	6.45E-08	2.0

SPECIMEN 230501

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	86.38	34.16	8.47E-08	2.9
80	105.70	31.28	6.76E-08	2.3
105	118.18	23.28	6.35E-08	2.5
200	138.05	7.12	5.31E-08	1.8
305	130.93	-16.06	4.81E-08	1.4
350	94.86	29.80	2.31E-08	3.6
450	126.10	45.84	1.94E-08	2.7
505	155.08	51.10	6.87E-09	6.3
520	76.52	-7.54	1.27E-08	4.4
535	185.90	58.75	2.02E-08	5.0
550	105.57	53.45	1.66E-08	3.8
565	174.38	45.81	2.28E-08	3.9
580	326.66	-82.32	3.57E-08	3.1

SPECIMEN 230502

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	96.90	29.63	1.12E-07	3.2
80	112.97	37.81	9.73E-08	2.8
105	93.55	9.30	1.04E-07	5.9
200	126.96	5.62	7.92E-08	1.6
305	141.38	-3.75	6.14E-08	1.8
350	123.65	28.32	2.70E-08	2.2
450	144.63	24.86	2.35E-08	2.5
505	106.26	18.83	3.48E-08	2.2
520	45.11	64.53	1.91E-08	3.6
535	115.84	32.49	3.04E-08	3.7
550	113.90	34.36	3.71E-08	2.5
565	120.72	24.00	4.75E-08	2.3
580	140.97	13.85	1.98E-08	3.6

SPECIMEN 230701

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	134.30	32.49	2.39E-07	2.7
80	142.06	22.34	2.38E-07	1.9
105	142.96	16.89	2.34E-07	1.9
200	159.80	13.40	2.11E-07	2.0
305	161.33	14.39	1.41E-07	3.0
350	140.23	28.29	6.24E-08	2.4
450	148.51	30.11	6.45E-08	1.9
505	125.75	33.68	3.41E-08	1.8
520	152.02	36.78	1.93E-08	4.0
535	108.11	36.97	1.77E-08	3.5
550	95.42	-1.83	2.46E-08	8.5
565	202.85	31.29	1.24E-08	5.5
580	141.50	9.96	1.14E-08	7.9

SPECIMEN 240201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	160.05	9.18	3.60E-07	3.6
80	162.66	7.36	3.57E-07	3.5
105	161.83	6.53	3.68E-07	2.3
200	160.80	-0.68	3.62E-07	2.5
305	165.27	-0.98	2.58E-07	2.3
350	162.03	16.17	8.88E-08	2.8
450	165.43	17.71	9.33E-08	2.4
505	150.52	29.20	6.62E-08	2.7
520	148.41	46.61	5.10E-08	3.0
535	108.66	23.50	5.39E-08	2.8
550	145.57	45.66	4.94E-08	3.8
565	155.67	62.52	4.90E-08	4.8
580	285.95	72.40	6.36E-08	4.0

SPECIMEN 240402

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	171.12	44.78	1.16E-07	2.6
80	168.43	33.32	1.12E-07	2.4
105	175.86	23.43	1.25E-07	2.7
200	170.50	3.66	1.28E-07	1.5
305	166.44	-0.54	7.25E-08	1.8
350	166.89	7.75	2.95E-08	2.6
450	162.54	7.55	2.68E-08	2.9
505	178.60	1.85	2.14E-08	4.1
520	212.46	-22.71	2.43E-08	6.7
535	103.90	20.58	1.43E-08	9.4
550	138.50	36.51	2.49E-08	7.1
565	106.19	15.48	3.45E-08	4.5
580	130.69	-3.35	5.49E-08	5.7

SPECIMEN 240601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	256.11	76.42	1.88E-07	1.5
80	167.48	-1.15	1.42E-07	3.3
105	167.27	-34.61	1.57E-07	3.5
200	160.45	-33.41	1.95E-07	5.8
305	168.44	-36.90	1.61E-07	3.4
350	155.80	-50.47	6.69E-08	2.3
450	161.06	-52.11	6.92E-08	3.0
505	191.88	-67.33	5.17E-08	2.5
520	184.90	-72.57	5.02E-08	2.7
535	149.27	-64.85	4.65E-08	2.6
550	197.90	-84.35	3.59E-08	4.0
565	203.18	-77.41	3.37E-08	4.0
580	154.75	-68.18	3.69E-08	3.6

SPECIMEN 250101

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	160.51	15.91	2.03E-07	3.5
80	169.71	6.07	2.23E-07	2.4
105	156.99	5.34	2.25E-07	3.5
200	164.67	-1.14	2.12E-07	3.0
305	167.74	-7.43	1.38E-07	2.7
350	175.89	0.83	4.84E-08	3.1
450	167.92	2.03	4.96E-08	3.0
505	170.41	-13.32	1.24E-08	13.8
520	197.02	17.27	2.06E-08	6.8
535	90.12	39.26	2.38E-08	7.6
550	76.64	53.42	3.29E-08	6.5
565	157.97	58.55	2.63E-08	13.5
580	322.33	41.57	7.16E-08	4.6

SPECIMEN 250202

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	141.02	36.66	1.97E-07	2.2
80	151.32	29.73	1.98E-07	2.3
105	162.46	30.88	1.93E-07	2.0
200	163.65	14.72	1.79E-07	2.3
305	159.52	7.75	1.12E-07	2.7
350	148.04	18.09	3.21E-08	5.3
450	171.33	34.22	3.90E-08	4.4
505	160.11	34.59	2.16E-08	6.2
520	144.06	21.37	1.99E-08	9.0
535	134.90	21.15	2.68E-08	7.6
550	356.55	19.85	3.00E-08	9.2
565	70.43	-12.38	1.76E-08	11.9
580	223.71	3.34	9.00E-08	4.9

SPECIMEN 250301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	162.00	16.84	2.72E-07	4.6
80	161.02	4.18	3.00E-07	4.4
105	165.36	0.74	3.15E-07	1.9
200	172.57	-1.59	3.09E-07	1.9
305	171.51	-5.90	2.20E-07	1.8
350	175.95	-3.10	8.23E-08	3.3
450	176.53	-4.88	8.36E-08	2.7
505	177.74	-4.58	4.97E-08	4.5
520	162.01	-5.19	6.79E-08	4.3
535	163.72	-3.21	4.75E-08	6.0
550	202.87	7.62	2.65E-08	10.0
565	90.19	71.79	2.32E-08	11.5
580	163.74	-43.86	2.90E-08	11.0

SPECIMEN 250601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	151.95	8.23	2.97E-07	4.3
80	158.93	0.74	3.04E-07	3.3
105	159.19	-5.38	3.13E-07	3.8
200	156.46	-10.24	3.14E-07	4.0
305	164.03	-11.24	2.33E-07	3.8
350	157.65	-10.68	8.47E-08	3.4
450	154.99	-3.27	7.71E-08	3.5
505	152.29	3.32	4.12E-08	4.1
520	170.40	-19.89	2.19E-08	5.0
535	195.35	15.79	4.85E-08	2.8
550	164.10	21.32	3.70E-08	3.6
565	116.34	40.64	3.05E-08	3.0
580	162.05	54.75	8.24E-08	2.4

SPECIMEN 260102

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	146.00	21.52	2.65E-07	2.7
80	164.47	18.14	2.51E-07	2.6
105	162.33	13.80	2.50E-07	2.5
200	157.55	6.20	2.50E-07	1.7
305	157.28	1.83	1.78E-07	2.1
350	154.53	9.55	6.65E-08	2.6
450	148.53	9.32	6.80E-08	1.7
505	161.08	4.87	3.50E-08	3.5
520	169.47	34.89	2.28E-08	5.5
535	175.36	40.39	4.71E-08	4.5
550	106.97	54.95	3.90E-08	4.1
565	341.34	54.75	3.37E-08	4.8
580	163.44	-26.90	2.74E-08	6.5

SPECIMEN 260201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	143.38	19.88	4.28E-07	3.0
80	148.15	19.64	4.26E-07	1.6
105	147.27	18.39	4.01E-07	1.9
200	152.14	13.75	3.59E-07	1.9
305	154.62	12.04	2.36E-07	1.9
350	162.18	25.88	8.92E-08	3.7
450	158.62	25.17	9.07E-08	2.3
505	153.65	19.09	4.39E-08	3.0
520	193.76	-6.49	5.50E-08	4.1
535	163.50	54.88	3.90E-08	5.0
550	181.12	36.15	4.59E-08	5.2
565	121.16	22.87	3.82E-08	4.2
580	285.56	75.93	4.00E-08	4.6

SPECIMEN 260302

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	145.99	43.45	1.71E-07	1.3
80	144.36	37.00	1.49E-07	1.5
105	150.55	33.91	1.55E-07	2.0
200	149.88	7.85	1.38E-07	3.3
305	156.25	1.13	1.01E-07	3.0
350	155.09	15.06	3.34E-08	6.7
450	164.38	18.01	3.11E-08	3.5
505	150.67	52.23	1.86E-08	6.7
520	237.57	12.04	2.73E-08	6.4
535	154.99	23.50	2.55E-08	5.0
550	138.89	31.34	5.14E-08	2.6
565	169.26	10.29	8.11E-08	3.5

SPECIMEN 260702

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	170.03	50.94	4.82E-08	2.0
80	162.50	32.43	4.01E-08	1.8
105	160.08	23.50	4.18E-08	3.8
200	167.54	6.30	4.23E-08	3.2
305	172.50	-0.36	2.38E-08	3.7
350	172.63	24.03	2.33E-08	4.1
450	176.22	41.69	1.68E-08	7.2
505	125.69	31.57	4.66E-08	3.7
520	317.76	-26.96	1.59E-08	17.3
535	308.93	81.66	4.81E-08	7.5
550	347.52	27.12	3.49E-08	10.0
565	170.82	6.65	4.75E-08	5.4
580	193.99	7.99	9.44E-08	3.4

APPENDIX B

SPECIMEN 010101

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	330.69	78.61	3.04E-07	1.5
80	359.49	79.15	1.51E-07	2.3
105	123.76	61.22	4.46E-08	2.2
200	158.53	26.01	2.27E-08	2.2
305	169.35	30.31	3.37E-08	5.5
350	161.31	38.95	2.33E-08	1.1
450	61.87	69.71	1.46E-08	7.8
505	212.55	1.39	9.67E-09	10.2

SPECIMEN 010401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	346.77	74.12	1.70E-06	2.1
80	14.65	75.02	1.14E-06	2.3
105	114.83	19.84	1.94E-07	2.4
200	138.02	10.42	1.90E-07	1.6
305	138.21	-1.57	2.04E-07	18.2
350	150.04	-0.34	1.14E-07	1.8
450	149.79	-8.59	5.30E-08	1.5
505	182.27	-30.80	3.09E-08	3.6
520	151.56	-14.40	2.50E-08	2.2

SPECIMEN 010701

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	60.79	66.72	1.25E-07	3.4
80	53.97	66.23	1.04E-07	5.7
105	70.00	59.35	9.95E-08	3.4
200	82.88	65.46	7.36E-08	3.0
305	118.26	59.00	5.79E-08	8.8
350	230.70	27.67	4.72E-08	2.8
450	149.31	62.97	1.24E-08	3.0
505	90.27	33.15	6.42E-09	5.3

SPECIMEN 020201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	63.10	79.71	2.02E-07	1.7
80	128.91	74.54	1.05E-07	1.3
105	135.18	70.73	8.53E-08	8.5
200	164.29	48.53	6.53E-08	1.4
305	159.13	31.07	4.70E-08	14.8
350	171.89	32.13	2.95E-08	3.6
450	249.56	8.06	3.13E-09	999.0

SPECIMEN 020501

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	325.72	70.36	1.75E-06	1.7
80	14.12	76.27	2.53E-07	2.9
105	93.61	45.69	9.00E-08	1.9
200	108.41	51.02	8.27E-08	1.5
305	86.91	46.29	2.88E-08	2.0
350	124.24	36.73	3.08E-08	2.6
450	106.27	28.43	8.64E-09	999.0

SPECIMEN 020601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	27.59	66.34	1.63E-07	2.4
80	46.06	54.96	9.97E-08	2.0
105	77.77	40.93	7.35E-08	2.0
200	87.90	28.01	4.65E-08	2.9
305	136.81	35.30	3.01E-08	8.0
350	129.98	35.90	3.00E-08	3.0
450	41.65	12.66	2.38E-09	999.0

SPECIMEN 030101

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	357.52	43.43	2.95E-07	1.0
80	358.81	33.02	2.53E-07	0.9
105	355.13	20.21	2.24E-07	1.4
200	358.14	-25.47	1.66E-07	2.8
305	22.49	-42.61	1.30E-07	4.1
350	351.57	-41.12	1.19E-07	2.6
450	160.26	-31.14	6.89E-09	999.0

SPECIMEN 030302

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	357.82	19.86	2.05E-07	2.1
80	341.24	20.78	2.17E-07	2.2
115	351.40	6.61	1.76E-07	2.2
260	349.10	-32.47	1.56E-07	5.2
305	353.13	-36.40	1.16E-07	3.5
350	5.54	-38.97	5.79E-08	3.2
450	285.34	-16.01	1.04E-08	4.6
505	75.47	-35.24	5.75E-09	1.8

SPECIMEN 030401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	303.28	85.88	7.19E-08	3.2
80	19.17	66.05	1.03E-07	4.9
115	22.56	77.13	3.43E-08	5.8
260	11.64	-59.99	2.59E-08	3.6
305	355.49	-59.88	1.92E-08	4.5
350	190.60	-72.39	3.43E-09	5.5

SPECIMEN 030402

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	356.58	29.59	1.21E-07	1.7
80	4.50	34.17	9.46E-08	1.6
105	11.64	28.03	8.16E-08	1.8
200	3.17	-15.08	5.16E-08	2.7
305	17.82	-33.54	3.41E-08	12.5
350	12.48	-32.79	2.48E-08	3.2
450	112.15	39.80	4.05E-09	999.0

SPECIMEN 030501

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	31.65	85.06	2.83E-07	2.3
80	61.77	81.53	1.03E-07	1.7
105	171.59	52.08	3.05E-08	1.3
200	160.14	47.50	4.00E-08	1.7
305	199.06	19.76	2.35E-08	11.1
350	156.27	23.75	1.85E-08	5.0
450	187.32	34.84	6.89E-09	999.0

SPECIMEN 030602

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	188.39	81.83	4.19E-08	1.9
80	159.60	72.13	3.92E-08	1.7
105	165.82	64.66	3.58E-08	2.1
200	139.11	32.71	2.63E-08	3.7
305	139.48	41.46	2.69E-08	4.3
350	136.77	28.97	1.97E-08	1.9
450	44.27	61.29	6.74E-09	999.0

SPECIMEN 040101

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	109.16	67.23	5.09E-08	1.2
80	196.16	76.33	9.18E-08	2.6
115	109.52	58.71	4.62E-08	2.1
260	122.18	29.80	3.68E-08	2.5
305	145.90	30.98	2.76E-08	3.3
350	136.76	36.67	2.15E-08	4.8
450	136.65	41.22	1.89E-08	2.4
505	248.50	-15.94	1.86E-09	5.5

SPECIMEN 040201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	161.61	74.27	3.81E-08	1.6
80	124.59	67.45	3.39E-08	1.8
105	115.70	46.70	3.60E-08	1.9
200	124.85	34.16	2.07E-08	1.2
305	149.20	22.04	1.88E-08	5.1
350	147.61	29.90	9.77E-09	4.1

SPECIMEN 040202

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	255.29	38.61	3.30E-08	2.2
80	263.43	45.98	2.51E-08	2.0
105	283.88	46.42	2.23E-08	1.7
200	234.13	20.56	9.19E-09	2.5
305	202.13	16.28	1.23E-08	9.9
350	159.52	-4.32	1.19E-08	7.5
450	190.20	23.48	1.46E-08	3.3
505	356.02	-78.76	3.93E-08	1.9

SPECIMEN 040401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	78.56	69.46	3.99E-08	1.6
80	70.84	79.33	4.10E-08	2.7
115	90.54	68.48	3.60E-08	2.3
260	106.22	33.97	2.55E-08	3.3
305	136.62	31.27	2.34E-08	2.8
350	133.19	33.98	1.88E-08	2.5
450	98.03	6.64	1.87E-08	3.1
505	156.03	26.07	1.84E-09	21.3

SPECIMEN 040601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	69.39	78.35	5.59E-08	1.1
80	102.69	66.51	4.75E-08	1.1
105	113.07	62.91	4.35E-08	1.3
200	133.05	38.41	3.57E-08	1.6
305	148.03	26.11	3.59E-08	8.3
350	127.07	25.53	3.26E-08	3.2
450	109.67	16.04	1.32E-08	2.5
505	172.31	32.79	2.70E-08	3.2
520	218.10	79.10	1.72E-08	1.9
535	117.80	-10.57	3.17E-08	1.5
550	273.82	-50.79	2.59E-08	3.1

APPENDIX C

SPECIMEN 010102

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	28.49	38.37	8.23E-08	3.9
80	356.49	39.46	7.83E-08	3.1
115	1.71	45.82	7.25E-08	4.7
260	36.98	39.98	3.32E-08	2.5
305	68.98	35.65	3.07E-08	1.8
350	68.09	23.51	1.52E-08	1.9
450	71.91	-10.67	6.42E-09	7.1

SPECIMEN 010201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	29.93	52.81	7.76E-08	2.6
80	30.25	15.00	8.83E-08	3.5
105	32.24	41.92	7.05E-08	3.7
200	47.23	37.42	4.50E-08	3.4
305	97.47	33.61	2.28E-08	1.7
350	92.80	28.93	9.12E-09	4.3

SPECIMEN 010601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	16.12	27.27	8.27E-08	3.8
80	14.36	-1.61	9.30E-08	4.1
105	23.28	16.75	6.34E-08	3.3
200	29.15	8.46	3.46E-08	2.6
305	85.39	-3.19	1.93E-08	3.8
350	77.29	-27.20	1.62E-08	1.6
450	168.12	51.34	3.62E-08	3.3
450	98.45	38.23	3.14E-08	3.9
505	38.38	70.27	4.12E-08	5.3
520	178.81	55.63	1.36E-07	1.9
535	124.94	62.27	1.14E-07	2.5
550	125.58	50.16	2.25E-07	1.2
565	346.99	-53.51	1.68E-07	3.0
580	2.83	42.71	3.71E-07	3.7

SPECIMEN 010602

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	124.88	57.89	4.07E-08	1.6
80	132.88	55.54	3.83E-08	1.5
115	129.33	47.20	3.32E-08	1.2
260	141.10	11.57	3.06E-08	2.1
305	154.00	10.16	2.83E-08	1.9
350	193.53	-11.98	3.93E-09	9.0

SPECIMEN 010701

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	75.15	43.52	8.63E-08	2.3
80	70.47	44.09	8.08E-08	2.5
115	297.42	56.92	4.06E-08	2.2
260	151.18	51.08	2.81E-08	2.4
305	130.96	26.83	3.84E-08	2.9
350	106.76	37.45	2.73E-08	1.6
450	93.23	26.63	1.85E-08	4.7
505	116.58	32.59	1.71E-08	4.1
520	318.43	-2.89	2.93E-09	16.1

SPECIMEN 010702

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	124.89	60.02	6.92E-08	4.7
80	59.56	51.79	5.68E-08	3.4
105	122.08	50.63	6.06E-08	7.3
200	144.05	32.49	4.99E-08	3.4
305	129.05	29.59	4.32E-08	2.7
350	125.96	25.41	3.02E-08	1.7
450	148.22	23.46	6.63E-08	1.7
450	194.21	47.28	2.89E-08	8.6
505	336.28	-1.85	1.24E-07	3.0
520	115.27	-45.42	8.14E-08	1.7
535	51.12	-53.91	2.26E-07	1.3
550	298.21	-23.44	1.91E-07	3.5
565	271.64	69.19	2.37E-07	3.7
580	93.60	19.65	9.97E-08	2.3

SPECIMEN 020201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	344.71	31.03	2.17E-07	2.1
80	346.01	29.03	1.88E-07	2.3
115	347.52	27.57	1.59E-07	2.3
260	352.11	25.51	7.56E-08	3.7
305	6.26	27.92	5.14E-08	8.4
350	225.70	-56.09	4.34E-09	22.2

SPECIMEN 020202

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	17.55	7.24	2.69E-07	9.9
80	25.25	-2.02	2.72E-07	4.3
105	34.39	3.16	2.26E-07	6.3
200	31.83	-0.43	1.46E-07	4.2
305	49.84	-1.62	7.01E-08	3.5
350	31.69	-4.72	5.57E-08	3.9
450	348.35	40.88	7.92E-08	2.6
450	24.38	43.33	2.23E-08	7.2
505	278.80	11.99	6.99E-08	4.8
520	317.68	72.25	6.15E-08	5.5
535	7.61	13.80	2.79E-07	3.3
550	21.72	37.14	2.15E-07	4.0
565	48.65	56.05	1.71E-07	4.3
580	144.01	-18.14	1.75E-07	1.7

SPECIMEN 020301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	246.65	49.60	2.07E-07	2.6
80	235.19	3.97	2.81E-07	3.3
105	245.08	44.69	1.74E-07	2.6
200	219.71	41.52	1.15E-07	2.9
305	215.41	33.04	7.41E-08	3.2
350	200.34	28.73	5.89E-08	4.5
450	248.93	7.76	8.57E-08	2.9
450	220.41	2.81	6.85E-08	4.7
505	180.96	-53.89	1.71E-07	2.5
520	245.79	1.54	8.82E-08	3.7
535	226.12	-39.06	4.51E-07	2.1
550	10.47	76.81	6.13E-07	1.3
565	12.50	46.70	6.09E-07	1.5
580	298.18	59.27	5.07E-07	2.1

SPECIMEN 020401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	178.53	51.84	1.53E-07	1.1
80	200.48	49.41	1.51E-07	1.4
115	187.92	50.37	1.31E-07	1.4
260	174.79	53.61	6.32E-08	0.8
305	154.63	51.38	5.32E-08	1.1
350	205.15	-16.56	5.27E-09	11.1

SPECIMEN 020402

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	155.93	-28.62	2.04E-07	1.9
80	134.09	-39.24	1.76E-07	6.6
105	169.76	-35.10	1.69E-07	34.5
200	169.60	-27.38	1.10E-07	1.9
305	160.28	-18.66	8.71E-08	1.4
350	155.62	-24.63	4.55E-08	1.2
450	120.49	18.38	5.60E-08	2.0
450	125.67	14.69	2.39E-08	4.4
505	248.09	-43.33	1.10E-07	2.7
520	127.20	-58.12	4.83E-08	3.3
535	337.24	-52.98	9.20E-08	4.4
550	283.94	40.53	4.76E-08	6.8
565	78.64	58.04	5.90E-07	2.9
580	12.34	64.76	4.62E-07	3.9

SPECIMEN 020601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	336.25	38.38	2.32E-07	2.2
80	337.91	27.99	2.29E-07	1.7
105	337.04	34.83	1.89E-07	1.9
200	335.71	40.91	1.26E-07	2.1
305	342.64	62.80	5.90E-08	3.0
350	337.37	55.81	4.55E-08	2.5
450	288.26	54.07	2.91E-08	1.6
450	303.83	61.50	1.98E-08	3.0
505	286.46	32.91	6.96E-09	6.5

SPECIMEN 030101

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	294.76	77.66	4.05E-07	4.6
80	358.30	79.58	2.65E-07	3.7
115	59.00	89.79	1.70E-07	4.4
260	132.35	66.22	1.05E-07	3.0
305	141.51	57.88	9.30E-08	2.1
350	148.70	56.03	7.03E-08	2.1
450	122.94	64.02	2.20E-08	2.8
505	4.69	69.71	9.59E-09	4.8

SPECIMEN 030301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	271.09	78.99	4.56E-07	3.8
80	194.25	18.03	1.45E-07	2.3
105	179.94	17.97	1.34E-07	2.6
200	185.80	-0.05	1.35E-07	2.8
305	172.18	1.50	9.48E-08	2.0
350	171.39	-6.28	8.03E-08	2.7
450	168.34	-6.20	3.37E-08	1.7
450	164.12	-9.54	3.28E-08	3.0
505	171.84	2.81	2.97E-08	3.4
520	159.40	-12.98	3.23E-08	2.4
535	154.34	-4.68	2.26E-08	3.5
550	150.85	-67.75	1.37E-08	4.7
565	185.67	6.77	3.03E-08	5.0
580	134.42	5.73	2.00E-08	10.9

SPECIMEN 030302

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	222.69	81.48	4.47E-07	3.8
80	173.78	15.02	1.64E-07	2.3
105	160.85	-1.68	1.77E-07	2.2
200	171.34	-2.17	1.81E-07	2.5
305	159.48	-14.20	1.53E-07	1.8
350	177.64	4.74	9.93E-08	2.7
450	148.14	-20.31	5.74E-08	1.8
450	156.24	-17.69	6.55E-08	2.2
505	90.18	62.21	6.16E-08	3.6
505	142.74	-9.98	3.25E-08	2.2
520	142.66	0.27	2.51E-08	2.4
535	140.40	-17.79	3.44E-08	2.5
550	163.36	32.17	1.98E-08	4.4
565	188.69	5.07	3.76E-08	4.6
580	195.56	38.76	3.60E-09	40.3

SPECIMEN 030401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	306.87	74.48	7.01E-07	3.5
80	166.31	49.46	1.39E-07	1.8
115	150.47	47.68	1.39E-07	1.1
260	169.74	20.37	1.27E-07	2.0
305	167.90	16.51	1.15E-07	3.0
350	169.35	22.75	8.93E-08	2.2

SPECIMEN 030601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	25.75	82.65	3.46E-07	3.7
80	207.78	77.84	1.83E-07	3.1
105	157.39	67.30	1.74E-07	2.3
200	166.74	57.41	1.52E-07	2.3
305	160.87	47.28	1.35E-07	1.8
350	166.57	51.53	1.02E-07	1.5
450	133.16	49.99	2.45E-08	1.5
450	141.23	48.45	2.35E-08	2.6
505	114.98	10.91	3.98E-09	8.6

SPECIMEN 040101

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	163.91	35.02	8.83E-08	1.1
80	139.35	32.86	1.00E-07	1.8
115	148.63	33.84	1.02E-07	1.4
260	162.02	15.17	7.48E-08	0.8
305	160.05	14.49	6.33E-08	0.6
350	159.37	12.25	4.98E-08	0.8
450	159.78	11.48	2.67E-08	0.9
505	166.73	10.62	1.57E-08	2.1
520	163.75	13.83	1.21E-09	52.5

SPECIMEN 040401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	274.78	71.44	1.48E-08	2.8
80	20.89	70.97	1.78E-08	72.4
105	218.00	78.75	1.38E-08	3.1
200	202.46	30.19	3.77E-09	4.8

SPECIMEN 040501

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	180.71	28.14	3.35E-08	3.3
80	189.85	24.70	3.11E-08	4.7
115	177.35	43.37	3.89E-08	3.3
260	166.65	14.22	2.38E-08	2.8
305	167.97	11.16	2.11E-08	3.8
350	159.11	6.77	1.87E-08	2.5
450	168.37	25.05	1.27E-08	5.5
505	138.22	18.46	1.03E-08	5.8
520	158.02	-3.52	1.98E-10	124.4

SPECIMEN 040502

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	23.68	80.07	7.70E-08	3.5
80	162.52	50.98	7.57E-08	4.1
105	173.13	40.77	3.57E-08	5.6
200	141.94	20.38	3.76E-08	3.5
305	167.85	29.06	2.64E-08	3.5
350	151.26	17.30	3.20E-08	2.4
450	121.82	20.27	1.92E-08	1.8
450	116.45	22.68	1.76E-08	2.7
505	53.72	-0.75	1.25E-08	7.6
520	93.73	5.68	6.88E-09	5.0

SPECIMEN 040601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	168.80	66.62	6.68E-08	4.2
80	147.20	6.79	9.19E-08	3.3
105	165.31	2.47	5.84E-08	2.0
200	168.82	-10.63	6.04E-08	2.3
305	170.45	0.48	4.42E-08	2.4
350	163.92	-2.37	3.91E-08	2.0
450	185.75	-6.46	1.54E-08	4.5
450	172.32	8.55	1.12E-08	8.3
505	176.77	-7.03	7.52E-09	1.3

SPECIMEN 050102

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	131.07	39.67	1.97E-07	1.8
80	134.63	41.19	1.82E-07	9.1
105	140.22	39.62	1.74E-07	44.5
200	130.83	25.82	1.57E-07	4.8
305	146.48	22.65	1.31E-07	2.3
350	149.95	16.92	1.04E-07	2.0
450	153.22	48.96	3.71E-08	4.7
450	131.24	13.36	3.00E-08	7.2
505	324.16	82.43	3.30E-08	5.9
520	152.28	38.90	5.21E-08	2.8
535	120.41	43.44	3.68E-08	4.3
550	289.61	-78.27	9.50E-08	2.1
565	147.00	37.94	1.91E-07	7.1
580	351.95	-28.95	7.50E-08	3.9

SPECIMEN 050302

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	134.20	49.26	2.30E-07	1.7
80	151.40	45.04	2.19E-07	2.1
105	139.14	36.84	2.24E-07	2.0
200	140.59	26.15	2.07E-07	1.9
305	156.98	24.35	1.74E-07	2.2
350	139.90	-4.84	9.73E-08	1.7
350	153.86	17.28	1.45E-07	2.5
450	123.75	42.06	5.83E-08	2.5
450	102.66	26.21	3.99E-08	3.9
520	76.46	26.99	1.79E-07	1.2
535	63.23	60.78	2.84E-07	0.7
550	82.59	66.22	1.67E-07	2.3
565	196.79	-63.97	2.69E-07	2.0
580	300.72	52.80	1.60E-07	3.3

SPECIMEN 050402

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	91.33	29.28	2.27E-07	2.4
80	79.47	30.16	2.26E-07	3.1
115	85.29	27.32	2.19E-07	2.8
260	117.72	14.32	2.05E-07	2.0
305	124.84	13.22	1.94E-07	2.4
350	175.65	17.46	6.10E-09	19.9

SPECIMEN 060201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	144.14	41.02	4.12E-07	1.8
80	145.40	38.23	3.54E-07	2.0
105	143.80	36.71	3.86E-07	4.0
200	157.99	27.96	3.53E-07	2.3
305	160.17	23.81	3.23E-07	2.0
350	149.68	23.72	1.88E-07	2.1
450	172.96	50.69	1.19E-07	1.6
450	135.87	45.71	9.75E-08	2.6
505	317.17	61.64	7.23E-08	6.0
520	96.12	30.07	6.23E-08	4.3
535	192.61	29.42	1.42E-07	2.4
550	100.27	34.78	1.03E-07	1.9
565	234.37	5.02	1.10E-07	3.0
580	283.37	48.12	1.03E-07	2.9

SPECIMEN 0601A1

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	152.06	44.86	4.75E-07	1.6
80	136.23	48.07	4.34E-07	2.8
105	141.10	46.85	4.39E-07	1.6
200	140.23	39.29	4.24E-07	2.8
305	137.56	33.85	3.71E-07	2.5
350	128.92	36.56	2.60E-07	2.0
450	133.18	45.91	8.66E-08	2.1
450	139.43	40.02	7.42E-08	1.8
505	240.84	43.86	1.11E-07	2.2
520	49.85	41.25	3.66E-08	4.8
535	294.93	16.78	3.09E-08	6.7
550	81.29	81.34	1.24E-07	3.0
565	358.57	-21.24	2.68E-07	1.8
580	265.16	10.06	2.12E-07	2.5

SPECIMEN 0604A2

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	138.58	34.07	3.33E-07	8.5
80	144.93	28.98	3.82E-07	5.7
105	164.13	31.65	3.47E-07	3.3
200	154.68	24.95	3.46E-07	3.2
305	159.60	18.17	3.15E-07	2.9
350	158.34	16.06	2.57E-07	2.5
450	155.08	22.13	6.45E-08	2.6
450	158.00	18.34	5.81E-08	2.6
505	144.11	23.15	3.01E-08	2.2
520	24.88	48.62	1.94E-08	2.0
535	234.21	54.63	6.76E-09	3.2

SPECIMEN 0604B1

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	147.43	34.48	5.52E-07	2.9
80	152.31	29.94	6.15E-07	3.0
105	162.20	31.36	5.77E-07	3.5
200	145.19	19.48	5.74E-07	4.4
305	159.14	18.14	5.18E-07	2.6
350	156.82	16.40	3.69E-07	2.6
450	146.80	32.90	3.61E-08	2.3
450	152.15	16.34	3.03E-08	3.2
505	171.98	32.77	1.28E-08	3.4
520	333.25	25.22	1.45E-08	1.5
535	22.87	22.37	1.11E-08	3.9
550	322.41	25.55	8.46E-09	2.4

APPENDIX D

SPECIMEN 010101

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	161.38	22.90	2.78E-04	1.5
20	153.50	10.00	2.01E-04	1.7
30	165.95	4.24	7.18E-05	1.4
40	161.92	19.16	3.96E-05	1.9
50	149.77	33.04	4.19E-05	2.0
60	167.95	16.47	2.68E-05	2.1
70	171.95	44.40	2.86E-05	2.0
80	157.46	25.58	2.82E-05	2.7
90	146.33	18.85	2.04E-05	3.3
100	161.28	49.31	1.83E-05	3.1
110	179.44	27.98	1.98E-05	2.2
120	126.98	14.88	2.22E-05	2.5

SPECIMEN 010201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	140.01	4.32	1.94E-04	1.9
20	143.92	9.06	1.28E-04	1.5
30	143.37	7.99	6.86E-05	1.6
40	165.62	21.04	3.73E-05	1.0
50	155.14	19.30	3.21E-05	1.7
60	156.40	23.83	2.68E-05	1.9
70	155.49	11.41	1.53E-05	2.8
80	162.49	22.68	1.91E-05	2.3
90	139.09	27.51	2.03E-05	2.3
100	157.70	-5.28	1.25E-05	3.8
110	160.03	32.15	1.58E-05	2.8
120	155.31	17.67	1.64E-05	2.4

SPECIMEN 010202

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	167.54	-11.85	2.00E-04	0.6
15	157.86	6.85	1.59E-04	0.6
20	156.28	10.36	8.58E-05	0.9
1	140.90	7.71	7.12E-05	1.5
2	151.33	19.45	8.74E-05	0.8
3	147.65	13.63	7.33E-05	0.8
80	148.72	11.61	7.46E-05	1.1
115	141.51	8.94	7.33E-05	0.9
260	142.77	6.00	7.42E-05	1.3
305	138.80	5.82	7.43E-05	1.9
350	128.44	3.92	7.52E-05	4.2
450	128.45	6.85	6.84E-05	3.0
505	136.31	1.18	5.26E-05	1.5
520	149.20	2.85	3.09E-05	1.6
535	149.06	9.32	4.04E-05	1.6
550	140.66	9.92	4.22E-05	3.8
565	135.58	40.23	1.39E-05	5.7
580	147.22	-37.26	6.30E-06	9.0

SPECIMEN 010203

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	228.01	-24.77	7.42E-04	1.3
80	234.93	-25.94	7.25E-04	1.1
115	223.46	-24.22	7.10E-04	1.0
260	223.78	-23.37	5.79E-04	1.4
305	218.37	-21.90	5.09E-04	2.1
350	218.46	-21.38	4.50E-04	1.2
450	214.18	-19.89	3.42E-04	3.6
505	207.56	-18.30	2.58E-04	2.8
520	74.99	-74.09	1.05E-05	19.1

SPECIMEN 010302

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	151.56	13.69	4.88E-05	1.4
80	147.85	8.87	5.02E-05	1.1
115	148.78	9.13	5.04E-05	1.1
260	155.25	7.16	5.03E-05	1.3
305	148.70	3.61	4.89E-05	0.9
350	147.53	3.97	4.75E-05	0.7
450	151.53	8.67	3.52E-05	1.0
505	143.97	6.99	3.25E-05	1.1
520	161.30	10.26	2.18E-05	2.7
535	163.02	9.98	1.62E-05	2.2
550	166.97	13.28	1.62E-05	1.6
565	143.48	4.14	1.66E-05	4.1
580	286.13	29.68	1.17E-06	4.4

SPECIMEN 010303

TEMP.	DECL.	INCLIN.	INTENSITY	α95
20	155.75	18.51	3.90E-05	1.0
80	152.97	13.09	3.95E-05	1.5
115	154.76	13.72	3.95E-05	2.8
260	149.38	7.44	3.99E-05	0.8
305	154.92	8.68	3.93E-05	0.9
350	153.63	8.15	3.87E-05	2.1
450	152.43	11.01	3.16E-05	1.1
505	161.75	16.30	2.66E-05	1.4
520	150.52	14.20	2.42E-05	1.6
535	149.88	11.30	2.08E-05	5.3
550	152.36	16.19	1.82E-05	1.5
565	219.56	69.70	1.81E-06	7.8
580	218.64	34.67	3.35E-06	3.1

SPECIMEN 010401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	158.61	-14.77	3.44E-04	1.0
15	144.14	3.74	2.73E-04	0.9
20	148.85	15.51	1.09E-04	1.2
1	129.43	17.90	1.13E-04	1.3
2	161.48	41.09	9.25E-05	1.5
3	154.26	20.96	9.56E-05	1.6
80	153.86	18.22	9.81E-05	1.5
115	147.59	12.58	9.28E-05	1.3
260	146.73	21.24	1.12E-04	1.2
305	152.17	20.49	1.13E-04	1.1
350	152.65	20.94	1.16E-04	1.1
450	157.62	21.91	8.70E-05	1.5
505	171.81	-8.39	9.59E-05	1.6
520	174.24	32.60	8.34E-05	2.8
535	147.87	18.45	7.69E-05	1.5
550	153.40	12.18	5.81E-05	1.6
565	165.88	14.65	5.40E-05	2.0
580	136.96	12.86	5.73E-05	3.1

SPECIMEN 010402

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	193.48	-36.54	7.55E-04	0.9
20	164.07	6.55	3.41E-04	2.9
30	135.62	7.85	1.16E-04	1.5
40	158.67	24.47	5.80E-05	2.0
50	148.40	27.02	3.51E-05	2.8
60	157.91	53.33	2.69E-05	4.9
70	168.51	18.06	1.69E-05	6.0
80	164.87	54.83	1.47E-05	8.1
90	143.09	44.68	2.45E-05	4.8
100	179.08	12.93	8.85E-06	12.2
110	229.99	51.35	7.27E-06	16.9
120	108.45	48.08	2.39E-05	8.1

SPECIMEN 010501

TEMP.	DECL.	INCLIN.	INTENSITY	α95
20	159.77	-21.71	1.76E-04	1.2
30	153.38	-14.31	1.27E-04	1.8
40	168.00	11.25	6.90E-05	2.0
50	153.76	26.10	4.20E-05	3.4
60	164.70	35.08	3.70E-05	3.1
70	157.99	34.51	1.88E-05	5.7
80	191.21	23.74	2.16E-05	5.3
90	160.83	38.54	2.31E-05	5.0
100	194.86	-25.98	1.67E-05	9.5
110	190.51	33.64	1.57E-05	7.9
120	141.94	21.61	1.69E-05	7.1

SPECIMEN 010601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	171.18	-36.28	3.43E-04	0.9
20	146.85	12.18	1.83E-04	2.2
30	131.64	9.13	9.00E-05	1.4
40	162.03	22.79	4.22E-05	1.8
50	152.67	36.15	2.92E-05	2.6
60	156.18	38.70	2.11E-05	3.1
70	114.08	-3.04	7.30E-06	13.0
80	192.15	44.80	1.72E-05	4.9
90	147.56	43.99	1.23E-05	6.5
100	218.22	-64.59	8.36E-06	12.5
110	180.50	22.67	1.67E-05	4.2
120	154.82	27.04	1.05E-05	5.6

SPECIMEN 010603

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	221.42	-18.41	9.49E-04	1.7
15	206.68	12.56	4.17E-04	2.3
20	166.14	14.12	1.11E-04	1.6
1	165.03	11.96	9.16E-05	1.3
2	169.94	31.31	9.20E-05	1.4
3	157.70	24.12	7.84E-05	1.3
80	158.80	18.95	8.76E-05	1.3
115	154.98	16.40	8.13E-05	1.5
260	158.32	16.75	9.02E-05	1.2
305	158.41	19.60	9.55E-05	2.1
350	176.52	23.85	8.54E-05	3.1
450	145.79	14.42	1.06E-04	2.2
505	149.81	-7.50	7.33E-05	1.9
520	136.22	22.93	8.78E-05	1.7
535	153.04	13.00	6.94E-05	1.6
550	147.72	7.90	5.70E-05	2.0
565	204.43	-36.22	1.34E-05	9.0
580	123.26	-35.52	1.22E-05	8.4

SPECIMEN 020101

TEMP.	DECL.	INCLIN.	INTENSITY	α95
20	130.39	9.47	1.13E-04	0.9
30	137.07	13.20	6.24E-05	1.3
40	148.28	25.82	4.36E-05	1.8
50	154.11	34.63	3.11E-05	2.2
60	154.14	40.41	2.29E-05	2.3
70	134.87	46.27	2.11E-05	2.0
80	152.15	45.90	1.27E-05	3.5
90	120.18	43.09	8.78E-06	3.3
100	148.45	55.37	1.15E-05	3.6
110	149.64	20.23	5.47E-06	4.7
120	134.42	23.20	5.79E-06	5.0

SPECIMEN 020201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	163.57	39.70	6.68E-05	1.6
5	163.00	40.03	6.58E-05	1.9
10	169.98	38.94	6.53E-05	1.4
15	167.10	40.12	6.53E-05	1.3
20	167.33	39.38	5.42E-05	1.3
1	171.03	38.01	5.12E-05	1.3
2	170.96	37.97	5.04E-05	0.9
3	166.72	39.42	4.95E-05	1.2
80	163.11	39.93	4.91E-05	1.6
115	159.01	38.51	4.96E-05	1.5
260	160.82	39.73	4.87E-05	1.2
305	170.55	36.88	4.89E-05	1.2
350	154.00	41.81	4.86E-05	1.4
450	179.98	35.11	4.79E-05	1.0
505	163.04	44.90	4.51E-05	1.2
520	166.78	44.08	4.53E-05	1.2
535	161.30	45.14	4.40E-05	5.5
550	171.21	42.00	4.36E-05	1.5
565	173.58	36.17	8.30E-06	2.0
580	159.17	-28.64	9.34E-07	5.5

SPECIMEN 020202

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	157.16	32.22	6.93E-05	2.0
5	153.19	35.85	7.35E-05	1.8
10	153.82	38.47	7.35E-05	1.7
15	158.07	38.38	7.30E-05	2.2
20	160.17	40.31	6.52E-05	1.6
80	157.57	40.86	6.49E-05	1.7
115	163.50	39.28	6.51E-05	3.6
260	166.03	37.20	6.49E-05	1.2
305	158.48	37.76	6.57E-05	1.2
350	167.50	38.13	6.45E-05	1.4
450	178.70	36.60	6.30E-05	1.3
505	162.97	43.86	6.16E-05	2.7
520	166.42	42.94	5.96E-05	4.5
535	170.20	45.07	4.25E-06	2.0
550	168.52	43.35	3.73E-06	2.0
565	144.47	43.12	3.71E-06	4.6
580	129.26	47.90	3.66E-06	4.6

SPECIMEN 020203

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	155.23	38.44	1.02E-04	1.2
20	154.06	41.13	9.34E-05	4.4
30	170.49	34.22	6.99E-05	1.2
40	155.08	38.24	5.96E-05	3.1
50	156.66	41.42	5.15E-05	2.3
60	162.97	36.17	3.17E-05	1.5
70	171.16	32.27	2.60E-05	1.2
80	166.49	38.72	2.10E-05	2.5
90	159.44	37.31	1.21E-05	3.7
100	148.35	35.66	9.49E-06	4.0
110	143.28	39.72	7.54E-06	3.7
120	143.99	21.59	6.59E-06	4.2

SPECIMEN 020301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	158.81	38.28	5.13E-05	1.0
80	164.38	37.15	4.91E-05	1.2
115	157.48	34.37	4.87E-05	0.9
260	164.74	33.98	4.63E-05	1.2
305	152.24	30.80	4.52E-05	0.7
350	152.69	30.96	4.43E-05	0.9
450	159.44	35.54	4.07E-05	1.2
505	167.06	41.50	3.63E-05	1.8
520	23.24	61.29	1.00E-06	34.3

SPECIMEN 020302

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	150.88	19.91	4.95E-05	2.4
5	163.35	25.61	4.87E-05	1.1
10	167.19	31.22	4.86E-05	1.4
15	163.10	32.06	4.72E-05	1.2
20	158.38	32.21	4.16E-05	1.0
80	162.14	32.80	4.14E-05	1.2
115	157.79	31.53	4.14E-05	2.0
260	153.09	27.16	4.10E-05	0.7
305	165.15	30.58	4.05E-05	0.9
350	159.64	29.08	4.04E-05	0.9
450	158.61	33.07	3.67E-05	1.1
505	158.98	39.32	3.01E-05	1.3
520	180.77	47.93	2.45E-05	1.5
535	172.14	44.64	2.55E-05	1.3
550	96.41	13.07	8.43E-07	6.6
565	163.74	-48.61	1.83E-06	5.4
580	180.46	-7.72	1.39E-06	6.4

SPECIMEN 020401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	142.63	-77.84	1.33E-03	0.4
20	183.40	7.71	6.52E-05	0.9
30	183.87	22.21	4.34E-05	0.6
40	161.25	28.08	3.07E-05	3.2
50	167.90	34.04	2.78E-05	2.1
60	164.69	32.51	2.44E-05	1.5
70	168.00	28.04	1.94E-05	1.5
80	166.17	21.15	1.69E-05	2.2
90	161.21	25.60	1.43E-05	4.6
100	161.85	25.35	1.10E-05	4.2
110	154.90	16.21	1.11E-05	2.0
120	139.33	27.46	1.22E-05	3.2

SPECIMEN 020403

TEMP.	DECL.	INCLIN.	INTENSITY	α95
20	175.88	26.05	3.91E-05	0.6
1	179.60	27.90	3.91E-05	0.7
2	176.36	33.41	3.71E-05	0.9
3	175.17	30.74	3.63E-05	0.7
80	172.92	29.17	3.55E-05	1.2
115	177.95	25.82	3.56E-05	0.8
260	177.97	16.10	3.46E-05	1.2
305	185.38	26.57	3.58E-05	1.1
350	174.04	28.81	3.34E-05	0.9
450	182.02	31.36	3.03E-05	0.8
505	185.59	30.03	1.98E-05	0.6
520	234.56	28.85	1.97E-05	1.8
535	187.80	37.91	2.21E-05	0.7
550	214.48	33.00	1.97E-05	1.2
565	200.11	37.59	2.03E-05	0.8
580	183.57	2.25	1.24E-06	4.8

SPECIMEN 020601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	165.75	23.69	2.81E-05	2.2
5	158.77	23.60	3.03E-05	1.6
10	153.53	25.34	3.15E-05	1.6
15	149.17	25.15	3.22E-05	1.7
20	154.92	26.33	3.03E-05	2.1
1	156.73	26.37	2.90E-05	1.3
2	161.64	26.47	2.87E-05	1.6
3	148.76	25.75	2.83E-05	1.3
80	157.66	25.27	2.84E-05	1.6
115	153.20	20.52	2.77E-05	2.2
260	156.02	23.81	2.83E-05	1.2
305	156.42	24.14	2.83E-05	1.5
350	155.94	25.36	2.76E-05	2.3
450	164.04	31.59	2.46E-05	2.6
505	163.01	35.35	2.18E-05	1.6
520	171.23	37.70	2.17E-05	1.6
535	155.21	37.18	2.06E-05	2.1
550	157.15	38.30	1.85E-05	1.5
565	37.17	-70.12	3.22E-06	2.8
580	188.62	42.46	1.15E-06	8.1

SPECIMEN 020602

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	167.07	25.90	3.44E-05	2.5
80	156.21	24.25	3.43E-05	3.7
115	172.38	24.09	3.43E-05	2.2
260	158.80	21.74	3.46E-05	2.2
305	168.55	22.28	3.40E-05	2.1
350	160.44	22.41	3.37E-05	2.0
450	166.55	26.55	3.08E-05	2.2
505	162.00	32.81	2.70E-05	4.7
520	355.11	73.64	5.97E-07	32.1

SPECIMEN 020603

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	156.02	23.54	4.23E-05	1.7
20	153.34	27.94	3.70E-05	2.4
30	150.94	31.85	2.85E-05	2.4
40	156.86	32.72	2.59E-05	2.2
50	149.60	30.68	2.23E-05	2.7
60	152.73	36.14	1.50E-05	2.8
70	150.65	36.02	1.31E-05	4.8
80	153.37	31.44	1.04E-05	2.9
90	146.84	34.53	6.75E-06	3.4
100	148.49	34.62	5.83E-06	3.6
110	148.50	30.14	4.81E-06	3.5
120	145.71	32.62	3.62E-06	4.4

SPECIMEN 030103

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	3.31	36.88	3.52E-04	0.7
5	71.31	79.64	1.53E-04	1.1
10	155.02	-8.89	1.17E-04	0.7
15	157.79	-10.29	1.07E-04	0.8
20	145.57	-3.66	3.73E-05	1.1
1	132.26	-12.12	2.50E-05	1.5
2	138.25	-28.05	3.40E-05	1.4
3	139.20	-33.44	2.67E-05	1.6
80	133.15	-37.04	2.89E-05	1.9
115	121.11	-42.30	2.85E-05	3.8
260	138.48	-26.14	2.91E-05	2.5
305	147.91	-21.05	2.95E-05	1.7
350	145.03	-22.92	2.70E-05	2.7
450	147.77	-17.63	2.78E-05	1.8
505	118.24	-55.68	2.70E-05	0.8
520	183.16	-10.97	1.21E-05	3.7
535	148.12	-41.46	2.19E-05	1.8
550	155.76	-28.00	2.28E-05	1.7
565	93.11	74.36	1.61E-05	2.8
580	193.98	-67.95	1.19E-05	3.0

SPECIMEN 030201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	323.32	83.99	1.50E-04	1.3
5	237.18	88.08	9.76E-05	1.5
10	160.06	35.15	6.09E-05	1.0
15	155.56	31.51	4.72E-05	1.1
20	135.43	37.78	2.50E-05	1.1
1	127.33	31.44	2.19E-05	1.0
2	124.98	29.44	2.36E-05	0.8
3	120.21	38.27	2.09E-05	0.9
80	130.67	40.23	2.08E-05	0.9
115	126.86	38.83	2.08E-05	1.1
260	137.12	30.47	2.12E-05	0.8
305	133.28	26.69	2.12E-05	0.8
350	134.66	26.10	2.18E-05	0.9
450	145.18	27.52	1.89E-05	1.8
505	142.09	34.78	1.32E-05	1.1
520	138.60	31.58	1.35E-05	1.0
535	136.53	26.45	1.22E-05	0.8
550	136.46	30.17	1.22E-05	1.5
565	155.18	-37.16	4.48E-06	4.5
580	94.43	64.14	2.58E-06	3.8

SPECIMEN 030202

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	4.73	46.49	1.18E-04	0.4
20	143.00	26.93	3.97E-05	0.9
30	143.74	31.55	2.63E-05	1.2
40	157.23	40.09	2.07E-05	1.2
50	176.05	49.29	1.65E-05	3.5
60	151.66	47.55	1.37E-05	2.0
70	155.14	54.41	8.90E-06	2.7
80	165.92	59.67	5.41E-06	3.2
90	162.92	59.23	5.41E-06	2.8
100	188.05	44.25	7.06E-06	1.7
110	169.33	62.64	3.70E-06	6.3
120	182.54	44.49	4.18E-06	4.0

SPECIMEN 030301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	351.95	38.42	5.67E-04	0.4
5	4.98	49.21	3.69E-04	0.5
10	128.45	23.44	8.85E-05	1.9
15	152.22	8.83	1.14E-04	1.2
20	159.91	4.51	5.75E-05	1.4
80	160.44	4.66	5.81E-05	0.8
115	165.12	3.15	5.77E-05	0.9
260	161.91	5.70	5.67E-05	2.0
305	160.99	4.25	5.39E-05	1.0
350	166.67	3.50	6.03E-05	1.0
450	167.44	-4.75	5.13E-05	1.7
505	168.32	-2.12	4.55E-05	2.5
520	177.33	-5.48	4.16E-05	0.6
535	161.24	1.67	2.05E-05	1.7
550	142.97	-4.73	1.55E-05	2.5
565	115.60	-11.94	3.61E-06	13.5
580	321.01	-36.74	5.34E-06	6.2

SPECIMEN 030501

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	163.78	4.52	2.08E-03	0.9
5	171.32	-1.90	1.69E-03	1.2
10	166.57	7.28	1.12E-03	0.9
15	147.87	-6.79	2.87E-04	1.3
20	154.90	3.23	8.01E-05	0.7
1	167.06	4.51	8.51E-05	0.9
2	147.08	-1.30	7.66E-05	1.0
3	148.41	7.06	6.90E-05	1.1
80	155.43	1.87	6.94E-05	0.8
115	144.53	5.35	6.93E-05	0.9
260	137.26	10.62	6.95E-05	4.2
305	155.45	0.61	6.54E-05	0.9
350	155.49	1.53	6.24E-05	0.8
450	153.61	11.46	5.88E-05	1.3
505	144.26	-12.73	4.26E-05	0.7
520	171.93	10.17	4.67E-05	1.1
535	151.85	1.43	3.73E-05	1.2
550	144.69	-0.57	3.14E-05	1.5
565	290.85	64.19	1.62E-05	2.8
580	299.65	42.48	1.14E-05	4.5

SPECIMEN 030502

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	87.42	78.36	3.41E-04	1.1
20	143.73	21.77	1.26E-04	1.1
30	170.88	11.37	5.77E-05	0.5
40	164.85	28.72	2.51E-05	1.3
50	170.99	38.00	1.71E-05	1.9
60	153.78	27.60	5.98E-06	5.3
70	147.76	30.13	1.60E-05	2.5
80	225.11	15.47	1.06E-05	3.1
90	112.56	34.17	5.90E-06	7.1
100	177.30	16.25	8.32E-06	3.0
110	216.15	0.98	1.65E-05	1.3
120	112.68	-44.98	3.57E-06	15.5

SPECIMEN 030602

TEMP.	DECL.	INCLIN.	INTENSITY	α95
20	158.57	4.13	1.12E-04	0.4
80	159.34	3.37	1.10E-04	0.6
115	159.01	3.16	1.11E-04	0.6
260	157.95	5.47	1.14E-04	1.2
305	153.75	12.32	1.13E-04	0.7
350	153.32	6.77	1.08E-04	0.7
450	157.60	1.61	1.01E-04	2.2
505	152.04	-1.50	9.90E-05	2.5
520	142.11	-9.33	7.89E-05	1.3
535	163.19	0.34	8.54E-05	0.4
550	168.32	-8.24	6.58E-05	0.6
565	294.99	45.63	2.53E-05	3.9
580	224.94	51.50	9.50E-06	6.5

SPECIMEN 040102

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	151.39	20.64	3.04E-04	0.9
15	152.84	13.26	2.10E-04	1.1
20	153.04	19.83	7.88E-05	1.1
80	152.58	18.52	7.86E-05	1.1
115	155.36	19.42	7.90E-05	1.1
260	155.72	18.76	7.97E-05	1.1
305	148.07	16.16	7.58E-05	1.2
350	155.41	18.19	7.35E-05	1.2
450	146.84	13.03	6.98E-05	1.1
505	177.11	-3.70	6.74E-05	1.7
520	116.17	37.39	6.82E-05	1.2
535	149.11	8.72	5.61E-05	1.2
550	147.42	7.25	4.25E-05	1.8
565	140.43	-1.88	3.98E-05	2.9
580	181.22	-56.23	8.19E-06	8.3

SPECIMEN 040202

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	190.63	8.43	3.56E-04	1.9
15	168.76	9.00	2.50E-04	1.2
20	154.93	25.27	8.60E-05	1.3
80	149.22	22.52	8.62E-05	1.1
115	149.22	22.68	8.59E-05	1.3
260	146.41	19.95	8.52E-05	1.1
305	156.47	24.23	8.89E-05	1.3
350	160.99	24.02	8.06E-05	1.2
450	146.12	18.29	7.53E-05	1.0
505	137.60	22.97	6.59E-05	1.7
520	182.20	32.51	7.29E-05	2.4
535	144.00	2.05	4.83E-05	1.1
550	58.66	70.64	4.70E-06	14.0
565	147.29	48.04	1.02E-05	5.2
580	260.87	-53.74	1.10E-05	4.3

SPECIMEN 040302

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	202.79	19.85	1.92E-04	1.6
15	169.62	18.73	1.82E-04	1.0
20	162.70	23.71	8.49E-05	0.9
80	154.20	20.18	8.42E-05	1.1
115	148.68	18.31	8.50E-05	2.1
260	151.84	15.22	8.61E-05	1.0
305	153.91	16.18	8.80E-05	1.5
350	154.00	16.68	8.68E-05	0.8
450	157.73	18.32	8.55E-05	1.1
505	156.85	19.76	7.73E-05	1.3
520	149.71	12.85	6.96E-05	1.6
535	156.28	12.51	5.55E-05	1.9
550	165.38	-3.45	4.85E-05	3.1
565	160.76	-4.20	3.80E-05	3.4
580	331.72	-2.87	3.44E-06	9.0

SPECIMEN 040401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	220.24	-16.84	3.38E-03	1.2
5	223.55	-21.45	2.35E-03	1.2
10	216.93	1.73	1.30E-03	1.7
15	186.38	-4.56	5.74E-04	1.2
20	165.39	11.57	1.12E-04	0.9
80	167.59	10.38	1.13E-04	1.3
115	161.70	9.67	1.12E-04	2.9
260	174.17	10.15	1.19E-04	1.0
305	174.50	9.22	1.12E-04	1.4
350	161.73	6.79	1.07E-04	1.4
450	167.90	6.64	1.06E-04	1.0
505	167.66	7.50	9.87E-05	2.5
520	185.25	7.75	5.84E-05	1.7
535	42.96	48.09	3.68E-05	2.9
550	28.11	-16.14	1.94E-05	3.5
565	195.10	47.05	7.81E-06	9.0

SPECIMEN 040502

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	122.00	-20.80	1.65E-04	1.5
15	144.78	2.91	1.85E-04	1.0
20	155.08	17.51	8.30E-05	1.0
1	156.33	18.86	5.70E-05	1.6
2	138.28	25.60	8.78E-05	1.1
3	135.18	22.84	7.70E-05	1.0
80	140.80	18.05	7.77E-05	1.2
115	147.28	19.46	7.57E-05	1.2
260	141.68	17.70	7.69E-05	2.9
305	146.06	18.33	7.69E-05	1.1
350	147.64	20.03	7.64E-05	1.2
450	130.58	17.22	7.61E-05	1.6
505	154.17	0.37	5.51E-05	1.4
520	168.80	51.81	6.37E-05	2.9
535	131.59	4.91	5.51E-05	4.6
550	143.42	12.58	4.29E-05	1.5
565	146.65	11.55	3.79E-05	1.8
580	143.02	27.47	2.05E-05	3.6

SPECIMEN 040601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
5	91.84	-76.61	2.92E-03	0.3
20	160.76	-3.78	1.95E-04	0.5
30	156.39	14.10	9.36E-05	0.3
40	164.80	32.23	4.84E-05	0.5
50	164.48	28.00	3.75E-05	0.8
60	167.22	24.50	3.23E-05	0.8
70	158.75	31.15	2.68E-05	1.2
80	173.12	24.21	2.53E-05	1.0
90	162.84	9.27	2.66E-05	0.9
100	159.95	36.49	2.82E-05	1.0
110	187.19	9.24	2.19E-05	1.0
120	167.38	0.67	2.40E-05	0.8

SPECIMEN 040602

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	24.71	-52.47	6.00E-03	0.8
5	11.36	-62.03	4.54E-03	0.9
10	8.83	-44.33	1.33E-03	1.4
15	51.38	-55.50	6.26E-04	1.1
20	156.77	-13.66	5.51E-05	1.1
1	138.96	-21.87	5.83E-05	3.4
2	164.60	8.08	5.43E-05	1.1
3	157.72	-8.83	5.51E-05	0.7
80	158.33	-16.49	5.70E-05	1.0
115	144.62	-15.27	6.06E-05	2.1
260	156.05	-14.97	6.33E-05	0.7
305	157.22	-20.73	6.28E-05	1.0
350	147.03	-19.26	5.84E-05	2.8
450	148.55	-17.79	5.45E-05	1.3
505	139.92	-17.60	5.68E-05	0.7
520	161.72	-25.42	4.84E-05	0.8
535	156.61	-28.64	4.44E-05	1.1
550	163.48	-27.23	4.42E-05	1.6
565	149.77	-46.38	3.25E-05	1.5
580	131.48	-45.76	8.25E-06	5.8

SPECIMEN 040703

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	6.35	-48.58	9.97E-04	0.6
15	43.00	44.29	4.36E-05	2.5
20	153.32	38.40	5.50E-05	0.9
80	154.88	35.77	5.46E-05	0.6
115	157.59	34.18	5.51E-05	0.7
260	156.26	32.14	5.65E-05	0.9
305	159.91	28.37	5.84E-05	0.8
350	160.40	33.60	5.72E-05	0.8
450	160.94	27.44	5.50E-05	0.9
505	159.56	31.35	5.13E-05	0.9
520	160.62	23.03	4.70E-05	1.0
535	191.42	21.79	3.08E-05	1.9
550	92.17	-54.86	8.38E-06	4.5
565	127.75	-7.82	9.00E-06	2.2
580	143.33	48.42	7.72E-06	5.7

SPECIMEN 050101

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	164.77	-38.85	3.53E-03	0.8
5	166.10	-40.00	2.94E-03	0.5
10	176.68	-27.30	1.61E-03	1.1
15	152.37	-47.60	6.55E-04	0.6
20	160.53	-37.31	1.96E-04	0.5
80	151.65	-31.54	1.96E-04	0.5
115	157.75	-34.75	1.96E-04	0.6
260	169.03	-37.91	1.93E-04	0.7
305	158.51	-34.59	1.95E-04	1.0
350	154.25	-33.51	1.93E-04	0.9
450	146.39	-28.41	1.79E-04	2.6
505	146.37	-26.72	1.71E-04	0.8
520	158.70	-33.12	1.58E-04	0.5
535	155.33	-30.21	1.44E-04	0.9
550	140.89	-26.87	1.22E-04	0.9
565	153.97	-28.66	1.28E-04	0.5
580	157.83	-45.32	1.30E-05	3.0

SPECIMEN 050201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	91.58	-21.41	1.06E-03	0.9
5	107.61	-15.57	7.10E-04	0.8
10	134.01	4.51	3.96E-04	1.0
15	126.75	-1.66	2.92E-04	1.0
20	135.98	-15.17	1.04E-04	0.6
80	133.31	-13.50	1.04E-04	0.6
115	135.82	-14.99	1.04E-04	0.7
260	135.72	-15.18	1.03E-04	0.5
305	138.44	-16.02	1.04E-04	0.5
350	136.49	-16.07	1.04E-04	1.4
450	139.33	-15.83	1.00E-04	0.8
505	133.72	-14.76	8.83E-05	1.0
520	114.38	-29.99	9.84E-05	0.8
535	131.05	-21.47	9.13E-05	0.6
550	130.01	-20.34	8.71E-05	0.5
565	135.18	-13.93	7.39E-05	2.0
580	158.06	-9.33	2.85E-05	0.9

SPECIMEN 050301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	144.61	15.98	8.10E-03	2.5
20	146.91	31.86	3.20E-03	1.4
30	167.68	11.77	6.78E-04	0.8
40	154.94	18.25	3.12E-04	1.0
50	165.14	32.46	2.60E-04	1.1
60	176.35	26.18	1.94E-04	0.8
70	181.29	24.99	1.50E-04	0.6
80	158.37	37.33	1.55E-04	1.1
90	178.65	22.53	1.22E-04	0.7
100	180.59	27.11	9.02E-05	0.8
110	168.43	32.16	1.02E-04	1.0
120	183.97	15.32	7.75E-05	0.8

SPECIMEN 050302

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	162.74	30.02	6.59E-04	1.4
5	155.78	26.20	5.69E-04	2.8
10	166.01	18.50	5.30E-04	1.2
15	145.44	9.59	2.83E-04	1.2
20	155.00	6.20	1.26E-04	1.1
80	156.47	5.79	1.26E-04	1.1
115	158.74	4.93	1.26E-04	1.2
260	155.77	7.05	1.29E-04	1.0
305	155.53	6.74	1.29E-04	0.8
350	153.19	5.54	1.25E-04	1.1
450	152.65	5.10	1.21E-04	1.1
505	152.19	3.53	1.06E-04	0.9
520	155.60	3.66	1.05E-04	1.0
535	158.04	8.99	1.08E-04	1.3
550	132.12	2.83	7.95E-05	1.9
565	153.92	28.26	6.29E-06	5.8
580	173.60	26.64	1.51E-05	2.3

SPECIMEN 050401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	141.58	12.25	7.13E-04	1.4
5	145.04	8.23	5.51E-04	1.3
10	159.51	16.86	4.22E-04	0.7
15	139.76	15.34	2.38E-04	0.9
20	152.51	16.77	7.40E-05	1.0
80	153.02	16.38	7.39E-05	0.8
115	159.17	14.19	7.41E-05	0.9
260	161.69	12.98	7.43E-05	0.9
305	158.98	13.47	7.50E-05	1.0
350	149.87	16.75	7.40E-05	1.2
450	157.60	15.26	6.86E-05	2.0
505	149.58	17.61	6.30E-05	1.6
520	148.06	17.41	5.83E-05	3.0
535	148.44	18.61	5.39E-05	1.3
550	151.89	15.16	4.98E-05	2.1

SPECIMEN 050501

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	141.23	26.71	6.47E-04	0.9
20	154.55	27.03	2.98E-04	2.3
30	157.99	8.03	1.05E-04	1.9
40	158.50	15.82	4.21E-05	1.3
50	180.47	34.88	2.41E-05	1.7
60	186.46	18.84	1.68E-05	1.8
70	212.39	62.68	1.07E-05	5.0
80	167.17	45.54	7.08E-06	8.2
90	138.96	23.30	5.83E-06	10.7
100	193.87	30.65	8.95E-06	3.6
110	231.95	-15.25	5.02E-06	7.5
120	147.47	-32.21	9.18E-06	7.7

SPECIMEN 050502

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha95$
0	114.19	16.16	9.25E-04	1.3
5	128.60	8.18	6.53E-04	1.0
10	137.28	22.18	4.18E-04	1.1
15	139.67	16.08	2.85E-04	1.4
20	152.36	7.19	8.41E-05	0.8
80	144.23	10.23	8.33E-05	1.3
115	152.07	7.11	8.40E-05	0.9
260	152.13	5.16	8.30E-05	0.9
305	154.51	7.72	8.47E-05	0.8
350	154.15	5.47	7.94E-05	0.9
450	154.16	7.89	7.87E-05	0.8
505	139.65	6.60	4.22E-05	1.6
520	155.16	4.83	6.15E-05	1.4
535	147.26	7.91	6.13E-05	1.5
550	146.63	2.11	5.33E-05	1.3
565	78.44	-10.15	9.70E-06	7.4
580	159.84	25.01	8.72E-06	5.4

SPECIMEN 050503

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha95$
0	98.69	19.87	4.07E-03	1.0
5	92.48	9.62	3.04E-03	1.0
10	86.59	20.45	1.82E-03	1.0
15	111.35	24.89	1.03E-03	1.0
20	133.15	26.33	2.60E-04	1.3
1	136.45	24.80	2.46E-04	1.2
2	136.64	23.11	2.23E-04	1.1
3	136.46	24.15	2.18E-04	1.7
80	136.73	23.88	2.18E-04	1.2
115	131.01	24.01	2.16E-04	1.3
260	134.07	17.50	1.96E-04	1.1
305	139.99	13.88	1.93E-04	1.0
350	128.04	7.53	1.38E-04	3.0
450	139.97	5.91	1.26E-04	1.3
505	124.78	5.30	1.02E-04	1.1
520	123.82	-13.57	1.38E-04	0.7
535	127.59	8.59	9.46E-05	3.9
550	139.42	9.65	5.19E-05	1.3
565	130.01	-2.91	2.10E-05	3.4
580	151.17	27.98	1.49E-05	7.4

SPECIMEN 050701

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha95$
0	189.59	25.72	1.62E-03	1.8
5	179.03	26.89	1.03E-03	1.8
10	174.33	24.94	8.24E-04	1.9
15	156.93	22.13	5.41E-04	1.2
20	153.08	17.87	1.59E-04	1.4
80	147.61	16.62	1.59E-04	1.2
115	163.84	19.41	1.58E-04	2.6
260	152.38	18.06	1.59E-04	1.7
305	154.36	14.62	1.59E-04	1.9
350	153.22	14.52	1.57E-04	1.6
450	152.72	14.14	1.47E-04	1.4
505	144.61	12.94	1.48E-04	1.0
520	150.97	13.78	1.37E-04	1.3
535	151.22	10.49	1.27E-04	1.5
550	159.10	13.92	1.36E-04	1.4
565	149.92	19.77	8.50E-05	2.5
580	185.33	25.59	9.43E-06	6.1

SPECIMEN 060201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	158.13	29.38	2.28E-04	0.6
5	163.93	27.34	2.18E-04	0.6
10	158.66	13.50	1.87E-04	0.4
15	155.75	12.50	1.16E-04	0.8
20	159.30	7.73	6.06E-05	0.5
80	157.63	6.48	6.02E-05	0.3
115	159.48	6.47	6.06E-05	0.4
260	166.41	5.28	6.15E-05	0.5
305	166.74	6.00	6.01E-05	2.6
350	163.43	5.54	5.91E-05	1.5
450	172.78	7.43	5.37E-05	1.0
505	156.98	8.72	4.59E-05	0.5
520	170.74	9.71	4.27E-05	1.7
535	173.75	8.36	4.02E-05	1.2
550	181.46	-60.95	4.12E-06	3.7
565	221.49	-23.33	2.52E-06	3.2
580	349.11	5.13	4.14E-07	36.2
305	156.33	18.57	1.24E-04	1.7
350	158.74	17.87	1.21E-04	3.2
450	156.83	15.79	1.10E-04	2.1
505	153.79	15.09	9.83E-05	1.1
520	128.93	72.83	1.89E-06	30.3

SPECIMEN 060302

TEMP.	DECL.	INCLIN.	INTENSITY	α95
20	192.69	-84.23	1.31E-04	0.6
80	195.71	-83.30	1.32E-04	0.4
115	192.30	-83.59	1.32E-04	0.7
260	199.77	-82.10	1.30E-04	0.5
305	198.07	-82.53	1.26E-04	0.7
350	197.70	-82.77	1.25E-04	0.5
450	214.02	-83.95	1.09E-04	0.5
505	229.63	-84.28	1.04E-04	0.5
520	226.42	-84.53	1.02E-04	0.6
535	233.23	-84.06	9.34E-05	0.5
550	113.78	-71.54	5.64E-06	2.6
565	37.28	-48.00	2.38E-06	3.3
580	50.00	-23.05	3.77E-06	3.4

SPECIMEN 060303

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	341.67	-20.28	9.37E-04	0.8
80	342.79	-20.75	8.98E-04	1.2
115	346.41	-21.34	8.66E-04	1.3
260	321.30	-19.51	6.60E-04	0.9
305	344.83	-22.05	5.71E-04	1.3
350	344.76	-22.51	5.05E-04	2.7
450	344.93	-23.58	3.55E-04	1.2
505	348.11	-24.17	2.67E-04	1.6
520	175.77	-38.05	1.20E-05	12.9

SPECIMEN 060203

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	116.86	-25.96	1.15E-03	1.5
80	120.44	-26.37	1.11E-03	2.6
115	120.29	-26.42	1.08E-03	1.8
260	118.01	-25.60	8.70E-04	1.9
305	117.37	-24.45	7.62E-04	2.2
350	133.04	-24.01	6.79E-04	1.2
450	116.06	-19.92	5.00E-04	1.8
505	119.01	-15.55	3.90E-04	1.7
520	287.06	-37.02	9.20E-06	11.5

SPECIMEN 060301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	164.04	31.13	1.23E-04	1.0
80	165.03	27.79	1.24E-04	0.8
115	164.81	26.68	1.25E-04	0.6
260	157.82	20.93	1.26E-04	1.3

SPECIMEN 060401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	166.04	43.82	1.98E-04	0.8
5	172.76	40.97	1.89E-04	0.8
10	162.87	24.31	1.51E-04	0.8
15	169.10	20.59	1.35E-04	0.9
20	164.47	11.66	6.09E-05	0.8
80	164.65	10.68	6.12E-05	0.7
115	165.83	10.59	6.06E-05	1.1
260	164.23	9.24	6.15E-05	0.7
305	164.85	11.06	6.19E-05	0.8
350	169.73	9.72	5.97E-05	1.0
450	161.99	8.91	5.39E-05	1.1
505	170.50	11.42	4.44E-05	1.4
520	163.72	16.46	4.50E-05	1.5
535	168.47	12.76	4.10E-05	0.9
550	168.36	14.85	4.01E-05	1.8
565	143.74	61.93	9.75E-06	1.2
580	136.77	77.35	1.10E-05	1.4

SPECIMEN 060402

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	106.06	12.71	3.20E-04	1.1
80	98.32	13.08	3.09E-04	0.8
115	97.37	14.35	3.01E-04	0.9
260	111.05	19.37	2.62E-04	3.5
305	117.51	20.71	2.43E-04	3.4
350	113.06	21.46	2.31E-04	5.0
450	134.30	20.74	2.06E-04	2.4
505	130.04	20.42	1.82E-04	1.3
520	232.41	53.65	4.57E-06	24.9

SPECIMEN 060501

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	156.83	22.56	7.81E-05	0.7
80	163.00	18.88	7.75E-05	0.8
115	162.36	17.95	7.80E-05	1.0
260	155.89	13.86	7.96E-05	3.4
305	156.29	12.33	7.93E-05	1.2
350	163.94	11.35	7.68E-05	1.1
450	157.09	10.13	7.04E-05	1.3
505	164.59	10.18	6.34E-05	0.9
520	339.99	83.97	1.13E-06	36.2

SPECIMEN 060303

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	341.67	-20.28	9.37E-04	0.8
80	342.79	-20.75	8.98E-04	1.2
115	346.41	-21.34	8.66E-04	1.3
260	321.30	-19.51	6.60E-04	0.9
305	344.83	-22.05	5.71E-04	1.3
350	344.76	-22.51	5.05E-04	2.7
450	344.93	-23.58	3.55E-04	1.2
505	348.11	-24.17	2.67E-04	1.6
520	175.77	-38.05	1.20E-05	12.9

SPECIMEN 060401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	166.04	43.82	1.98E-04	0.8
5	172.76	40.97	1.89E-04	0.8
10	162.87	24.31	1.51E-04	0.8
15	169.10	20.59	1.35E-04	0.9
20	164.47	11.66	6.09E-05	0.8
80	164.65	10.68	6.12E-05	0.7
115	165.83	10.59	6.06E-05	1.1
260	164.23	9.24	6.15E-05	0.7
305	164.85	11.06	6.19E-05	0.8
350	169.73	9.72	5.97E-05	1.0
450	161.99	8.91	5.39E-05	1.1
505	170.50	11.42	4.44E-05	1.4
520	163.72	16.46	4.50E-05	1.5
535	168.47	12.76	4.10E-05	0.9
550	168.36	14.85	4.01E-05	1.8
565	143.74	61.93	9.75E-06	1.2
580	136.77	77.35	1.10E-05	1.4

SPECIMEN 060402

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	106.06	12.71	3.20E-04	1.1
80	98.32	13.08	3.09E-04	0.8
115	97.37	14.35	3.01E-04	0.9
260	111.05	19.37	2.62E-04	3.5
305	117.51	20.71	2.43E-04	3.4
350	113.06	21.46	2.31E-04	5.0
450	134.30	20.74	2.06E-04	2.4
505	130.04	20.42	1.82E-04	1.3
520	232.41	53.65	4.57E-06	24.9

SPECIMEN 060501

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	156.83	22.56	7.81E-05	0.7
80	163.00	18.88	7.75E-05	0.8
115	162.36	17.95	7.80E-05	1.0
260	155.89	13.86	7.96E-05	3.4
305	156.29	12.33	7.93E-05	1.2
350	163.94	11.35	7.68E-05	1.1
450	157.09	10.13	7.04E-05	1.3
505	164.59	10.18	6.34E-05	0.9
520	339.99	83.97	1.13E-06	36.2

SPECIMEN 060502

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	126.61	-88.37	1.72E-04	0.9
5	135.50	-74.71	1.34E-04	1.0
10	152.98	-14.95	5.69E-05	1.5
15	145.08	-6.03	4.76E-05	1.4
20	161.87	11.58	3.21E-05	0.8
80	161.77	7.16	3.24E-05	0.9
115	167.58	7.48	3.25E-05	0.7
260	157.37	5.84	3.27E-05	1.0
305	163.15	5.68	3.28E-05	1.0
350	159.69	6.37	3.09E-05	1.1
450	156.64	8.31	2.70E-05	0.9
505	163.01	11.60	2.17E-05	0.7
520	175.52	12.12	1.67E-05	1.7
535	185.43	16.75	1.00E-05	1.7
550	183.82	20.74	7.88E-06	1.7
565	175.18	13.38	9.34E-06	2.7
580	205.76	-6.98	1.14E-06	7.7

SPECIMEN 060503

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	37.34	-3.83	2.93E-04	1.2
80	31.40	-3.40	2.72E-04	1.0
115	41.24	-3.31	2.60E-04	2.5
260	41.65	0.99	1.91E-04	0.9
305	37.72	3.29	1.58E-04	1.1
350	28.55	5.55	1.35E-04	3.6
450	48.87	10.16	9.76E-05	3.2
505	49.48	14.46	7.59E-05	1.3
520	243.02	-32.19	4.11E-06	20.9

SPECIMEN 060601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	150.79	33.78	1.92E-04	0.6
5	155.06	26.25	1.96E-04	0.7
10	144.66	12.89	1.52E-04	0.9
15	153.44	8.17	1.32E-04	1.1
20	155.59	10.71	4.85E-05	1.3
80	157.99	8.24	4.84E-05	1.0
115	160.62	8.41	4.84E-05	1.2
260	154.03	8.50	5.04E-05	1.2
305	156.53	9.10	5.10E-05	1.2
350	150.55	12.45	4.86E-05	1.5
450	159.95	12.78	4.52E-05	1.1
505	163.49	10.75	3.48E-05	1.5
520	156.18	9.98	3.31E-05	1.5
535	152.67	7.89	2.52E-05	1.7
550	164.84	24.79	2.76E-05	1.0
565	158.87	7.44	2.39E-05	1.5
580	127.04	42.94	3.62E-07	56.6

SPECIMEN 060602

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	48.12	35.01	1.48E-04	1.0
20	147.29	4.14	7.79E-05	1.6
30	144.87	19.86	3.98E-05	1.0
40	159.36	21.22	2.62E-05	1.2
50	162.09	11.87	1.91E-05	1.7
60	166.56	26.46	1.79E-05	2.1
70	158.66	17.14	1.31E-05	2.9
80	163.70	0.51	1.17E-05	2.4
90	146.56	31.51	1.58E-05	1.7
100	130.91	0.16	7.92E-06	1.4
110	159.71	-24.35	8.73E-06	3.1
120	141.20	24.97	1.37E-05	1.5

SPECIMEN 060603

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha95$
20	150.17	11.68	5.42E-05	1.0
1	152.72	21.03	4.85E-05	1.3
2	146.22	24.63	5.39E-05	0.9
3	148.67	17.20	5.41E-05	3.1
80	147.08	15.41	5.30E-05	0.9
115	150.54	13.99	5.38E-05	1.0
260	147.10	11.33	5.58E-05	1.1
305	156.02	8.73	5.42E-05	2.1
350	154.83	10.12	5.12E-05	1.8
450	157.67	9.82	4.44E-05	1.8
505	151.85	13.47	4.03E-05	2.9
520	152.14	6.95	3.62E-05	1.7
535	154.57	8.11	3.44E-05	2.0
550	154.15	12.83	2.89E-05	1.8
565	177.32	60.16	1.47E-05	2.1
580	139.05	76.58	9.10E-06	3.4

SPECIMEN 070101

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	121.20	9.85	6.39E-04	0.8
15	155.91	15.75	5.36E-04	1.9
20	161.52	-0.40	1.70E-04	1.1
1	176.87	-4.69	1.25E-04	0.4
2	158.02	8.36	1.17E-04	0.9
3	163.64	10.26	1.24E-04	2.6
80	163.17	8.14	1.28E-04	0.9
115	167.04	5.92	1.32E-04	0.9
260	170.03	2.92	1.28E-04	0.5
305	157.91	8.67	1.34E-04	1.8
350	153.82	9.17	1.31E-04	3.5
450	170.57	3.41	1.25E-04	0.7
505	165.19	21.11	1.13E-04	1.9
520	165.57	10.08	1.01E-04	2.3
535	152.11	11.81	1.07E-04	3.4
550	3.17	19.57	5.95E-06	7.2
565	190.31	-36.58	9.37E-06	3.1
580	147.35	-78.23	2.07E-05	3.4

SPECIMEN 070102

TEMP.	DECL.	INCLIN.	INTENSITY	α95
20	152.87	-3.22	2.04E-04	0.9
80	155.91	-4.66	2.08E-04	1.3
115	155.18	-4.74	2.07E-04	2.8
260	159.69	-6.62	2.10E-04	0.8
305	159.42	-5.53	2.12E-04	0.7
350	154.56	-3.79	2.08E-04	0.8
450	157.06	-2.79	1.97E-04	1.6
505	158.03	-1.20	1.74E-04	0.9
520	174.59	-0.58	1.77E-04	0.5
535	154.83	0.63	1.30E-04	0.9
550	165.82	-3.36	1.33E-04	1.1
565	145.77	-16.39	3.90E-05	1.6
580	317.68	47.60	1.82E-05	2.7

SPECIMEN 070103

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	176.94	8.22	6.90E-04	0.8
20	177.27	16.56	4.73E-04	0.6
30	185.98	1.10	2.27E-04	0.3
40	160.17	17.42	1.01E-04	1.0
50	153.11	19.45	8.11E-05	1.3
60	171.42	-6.03	9.01E-05	0.6
70	169.70	35.82	6.01E-05	1.2
80	169.74	36.04	6.01E-05	1.1
90	160.37	-19.95	7.76E-05	0.8
100	153.26	42.25	3.47E-05	1.6
110	113.16	-9.00	3.04E-05	1.5
120	159.27	-37.48	7.06E-05	0.5

SPECIMEN 070201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	146.54	1.76	2.16E-05	0.6
5	152.65	3.85	2.16E-05	1.5
10	149.90	2.71	2.12E-05	1.2
15	150.34	2.66	2.03E-05	1.1
20	143.71	0.67	1.71E-05	0.7
80	142.88	-2.37	1.73E-05	0.7
115	147.84	-0.34	1.73E-05	0.9
260	149.88	-4.30	1.79E-05	1.0
305	154.34	-3.17	1.76E-05	1.0
350	146.37	-12.88	1.63E-05	0.8
450	151.61	-0.74	1.05E-05	1.2
505	151.94	1.19	8.41E-06	1.0
520	152.26	2.60	7.91E-06	1.2
535	159.29	9.63	6.42E-06	2.2
550	153.20	12.91	3.86E-06	2.2
565	152.49	18.91	1.54E-06	2.9
580	359.67	-35.28	1.36E-06	3.9

SPECIMEN 070301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	160.87	15.57	3.98E-04	1.5
80	155.43	12.37	3.87E-04	2.2
115	155.86	11.69	3.86E-04	1.6
260	163.90	9.66	3.71E-04	1.7
305	160.32	9.33	3.62E-04	1.7
350	164.04	8.69	3.55E-04	2.0
450	146.44	8.22	3.23E-04	5.2
505	165.01	8.90	2.89E-04	3.6
520	167.31	-41.68	3.11E-06	24.8

SPECIMEN 070302

TEMP.	DECL.	INCLIN.	INTENSITY	α95
20	149.64	15.09	7.31E-05	1.4
80	156.06	10.04	7.43E-05	1.2
115	154.35	9.77	7.41E-05	1.6
260	158.66	9.26	7.52E-05	1.6
305	169.09	8.35	7.39E-05	1.3
350	158.40	8.05	7.47E-05	1.3
450	160.60	9.84	6.61E-05	1.3
505	163.32	12.32	6.30E-05	1.9
520	152.64	14.55	6.06E-05	1.6
535	158.25	13.92	5.01E-05	2.2
550	160.35	11.99	5.14E-05	1.5
565	151.97	15.57	2.23E-05	2.0
580	206.33	-34.39	7.08E-06	2.1

SPECIMEN 070303

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	183.70	-0.56	2.21E-04	1.7
80	188.44	-3.03	2.14E-04	1.3
115	176.63	-1.42	2.09E-04	1.6
260	174.63	-1.59	1.81E-04	1.8
305	184.45	-3.02	1.63E-04	1.3
350	179.83	-2.31	1.53E-04	1.6
450	191.01	-3.81	1.27E-04	1.2
505	179.83	-0.94	1.03E-04	2.8
520	119.19	-60.39	4.70E-06	38.7

SPECIMEN 070501

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha95$
0	167.07	15.89	5.44E-05	1.0
5	163.51	12.64	5.26E-05	1.6
10	164.63	5.56	4.93E-05	1.6
15	155.76	7.00	4.34E-05	2.2
20	145.85	16.85	2.38E-05	0.8
1	153.00	16.09	2.13E-05	1.1
2	156.89	13.77	2.11E-05	1.5
3	149.28	15.45	2.13E-05	2.3
80	151.27	8.24	2.23E-05	1.5
115	143.55	17.34	2.33E-05	0.6
260	146.67	5.06	2.38E-05	1.3
305	136.77	10.75	2.33E-05	2.2
350	142.10	5.35	2.31E-05	2.3
450	140.89	10.52	1.61E-05	2.3
505	147.39	9.44	1.10E-05	2.2
520	146.91	19.04	1.47E-05	2.1
535	144.39	18.07	1.17E-05	1.2
550	164.47	16.81	1.03E-05	2.1
565	152.34	21.80	5.74E-06	2.1
580	149.16	47.95	4.12E-06	2.2

SPECIMEN 070502

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha95$
0	145.53	-10.08	1.27E-04	0.9
20	160.22	-1.26	9.69E-05	1.2
30	149.40	11.50	3.03E-05	1.2
40	149.55	25.94	1.90E-05	1.3
50	149.62	8.09	2.12E-05	1.5
60	163.00	33.25	1.66E-05	1.2
70	141.17	29.43	9.20E-06	1.1
80	163.45	9.23	1.72E-05	1.7
90	166.33	35.88	1.59E-05	2.0
100	112.10	-13.71	9.82E-06	0.3
110	155.04	2.53	1.63E-05	1.4
120	148.19	45.16	1.54E-05	2.0

SPECIMEN 070601

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha95$
10	157.72	2.53	3.84E-04	0.8
20	158.21	-1.32	2.63E-04	1.4
30	137.33	8.54	9.65E-05	2.8
40	150.55	2.21	3.54E-05	1.1
50	151.51	9.25	3.54E-05	0.4
60	166.98	33.37	1.43E-05	1.4
70	136.44	-15.20	1.92E-05	0.4
80	158.16	8.65	2.20E-05	0.9
90	170.50	19.97	1.15E-05	1.7
100	119.94	-26.37	1.63E-05	1.2
110	183.87	-0.71	2.12E-05	1.5
120	159.83	15.18	1.47E-05	1.8

SPECIMEN 070603

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha95$
10	120.24	-1.68	1.80E-03	1.0
15	127.83	5.93	1.05E-03	0.5
20	144.39	23.95	2.13E-04	1.0
1	134.83	25.72	1.88E-04	0.9
2	138.28	30.10	1.87E-04	2.8
3	154.04	27.03	1.95E-04	1.6
80	147.84	26.01	1.93E-04	0.9
115	145.58	26.13	1.91E-04	1.0
260	153.18	20.72	1.86E-04	1.3
305	147.34	20.45	1.87E-04	1.0
350	151.90	16.89	1.69E-04	1.4
450	148.81	11.68	1.40E-04	0.6
505	157.79	8.39	1.25E-04	0.9
520	149.13	14.31	1.15E-04	0.6
535	146.00	7.86	9.26E-05	0.7
550	142.82	8.65	9.13E-05	1.2
565	143.25	4.44	8.69E-05	0.7
580	145.74	-6.10	3.70E-05	0.8

SPECIMEN 080101

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	230.35	-9.35	1.01E-03	0.7
5	231.57	-12.38	7.84E-04	0.7
10	215.95	4.19	4.92E-04	0.9
15	180.52	7.69	2.64E-04	1.3
20	167.46	22.78	7.62E-05	1.7
80	165.41	22.27	7.65E-05	1.5
115	170.78	23.16	7.63E-05	1.5
260	181.29	25.76	8.23E-05	1.6
305	164.09	21.56	7.67E-05	3.0
350	158.81	21.03	8.03E-05	1.4
450	159.79	25.76	7.06E-05	1.3
505	142.63	23.78	4.73E-05	1.2
520	166.22	28.88	6.26E-05	2.1
535	169.49	33.04	5.45E-05	1.9
550	141.74	36.65	4.39E-05	1.5
565	157.09	25.68	4.88E-05	2.7
580	128.37	-39.19	6.87E-06	9.7

SPECIMEN 080202

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	188.74	42.16	6.29E-04	0.4
20	169.10	20.37	3.98E-04	0.8
30	158.68	22.41	2.87E-04	0.9
40	154.91	35.98	1.45E-04	0.9
50	150.52	27.03	1.11E-04	1.2
60	152.61	36.42	9.89E-05	1.8
70	164.84	23.94	6.54E-05	1.4
80	108.93	10.63	6.22E-05	1.4
90	129.36	52.72	4.67E-05	1.8
100	196.66	8.71	2.33E-05	2.5
110	95.60	-3.40	5.08E-05	1.7
120	21.65	51.56	5.16E-05	1.1

SPECIMEN 080302

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	166.62	14.52	9.64E-04	0.5
5	157.84	6.75	8.31E-04	0.5
10	158.03	8.26	7.36E-04	0.6
15	168.26	8.31	4.35E-04	0.6
20	159.35	-2.38	1.42E-04	0.9
80	149.02	-11.08	1.42E-04	1.0
115	143.77	-15.57	1.42E-04	5.8
260	144.60	-13.14	1.41E-04	3.1
305	151.11	-8.56	1.42E-04	0.8
350	147.14	-13.59	1.46E-04	1.1
450	142.13	-12.45	1.35E-04	3.4
505	151.36	-2.46	1.27E-04	0.8
520	152.09	-3.56	1.16E-04	2.7
535	145.54	-10.52	1.15E-04	1.1
550	143.38	-16.73	1.03E-04	1.0
565	155.16	1.78	9.73E-05	1.8
580	271.82	41.41	8.35E-06	5.7

SPECIMEN 080401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	187.80	32.12	3.76E-04	1.0
5	160.35	21.25	3.59E-04	1.0
10	158.23	8.38	3.03E-04	0.9
15	145.67	9.18	1.92E-04	2.6
20	150.29	9.68	6.35E-05	1.5
80	150.01	10.18	6.40E-05	1.1
115	148.48	9.05	6.36E-05	1.4
260	155.68	10.00	6.47E-05	1.1
305	150.63	12.70	6.60E-05	1.1
350	152.51	8.17	7.02E-05	1.1
450	142.44	7.23	6.55E-05	1.3
505	152.26	4.78	5.48E-05	1.1
520	165.52	14.04	8.08E-05	0.7
535	151.40	8.27	4.01E-05	1.4
550	140.06	1.90	3.71E-05	1.5
565	72.47	-88.96	1.70E-05	2.8
580	136.14	55.45	9.98E-06	5.2

SPECIMEN 080501

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	199.59	21.46	1.25E-03	0.8
5	190.80	19.05	9.81E-04	0.4
10	178.14	7.10	5.53E-04	0.8
15	148.65	11.50	2.14E-04	1.3
20	145.52	9.64	7.39E-05	1.5
1	157.03	22.38	7.62E-05	1.1
2	132.39	1.23	7.06E-05	1.5
3	140.87	16.17	6.59E-05	1.6
80	134.03	15.79	6.69E-05	1.6
115	145.39	15.35	6.24E-05	1.8
260	140.24	16.45	6.97E-05	1.3
305	136.87	19.47	6.34E-05	1.4
350	138.80	14.30	7.36E-05	1.4
450	166.38	13.30	7.06E-05	1.0
505	132.79	-0.13	5.06E-05	1.5
520	129.33	31.64	5.89E-05	1.2
535	157.64	16.89	7.57E-05	1.1
550	138.73	8.81	5.76E-05	2.3
565	141.75	-0.78	5.57E-05	1.8
580	139.56	30.36	5.31E-05	1.4

SPECIMEN 080601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	183.74	8.13	6.49E-04	0.5
5	171.75	9.70	5.90E-04	1.9
10	169.55	4.32	4.63E-04	0.9
15	155.99	2.45	3.50E-04	1.5
20	140.97	-1.45	9.47E-05	1.8
1	131.74	-18.57	7.64E-05	1.6
2	130.95	11.65	8.02E-05	1.2
3	141.75	11.93	7.57E-05	1.3
80	144.06	10.26	7.58E-05	1.3
115	191.21	-31.47	3.16E-04	0.5
260	177.02	-22.64	1.77E-04	0.5
305	175.77	-21.38	1.56E-04	0.6
350	159.02	-17.45	1.37E-04	4.3
450	165.19	-13.44	1.11E-04	0.9
505	161.03	-21.08	8.72E-05	1.0
520	141.85	10.41	8.66E-05	1.3
535	144.65	-4.68	5.86E-05	1.5
550	151.94	-12.11	5.31E-05	3.2
565	346.61	-79.21	1.98E-05	2.9
580	285.34	-58.62	8.89E-06	6.9

SPECIMEN 080602

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	188.75	-2.71	5.82E-04	0.5
20	157.44	-2.49	2.60E-04	1.4
30	171.60	9.07	6.09E-05	0.9
40	139.90	40.82	2.91E-05	2.0
50	148.52	31.88	1.54E-05	3.5
60	157.03	63.56	1.06E-05	5.0
70	345.63	48.39	9.23E-06	4.6
80	202.95	27.21	6.32E-06	8.7
90	77.34	53.35	7.15E-06	7.1
100	344.02	7.28	6.52E-06	5.5
110	184.55	6.30	1.19E-05	3.4
120	32.59	43.83	1.03E-05	3.5

SPECIMEN 090101

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	359.54	-46.13	6.26E-03	0.8
5	354.71	-47.74	4.76E-03	0.8
10	13.20	-27.22	1.60E-03	1.8
15	23.30	-79.18	4.39E-04	1.1
20	145.49	-39.32	4.44E-05	2.0
80	151.40	-38.95	4.54E-05	2.2
115	140.74	-40.37	4.47E-05	1.9
260	134.70	-35.86	4.41E-05	2.3
305	146.36	-29.57	4.41E-05	2.1
350	140.07	-30.91	4.29E-05	2.4
450	158.96	-17.93	4.01E-05	2.4
505	143.33	-31.62	4.69E-05	2.2
520	137.25	-17.68	3.58E-05	2.3
535	60.48	32.33	4.07E-05	1.5
550	95.87	12.68	2.29E-05	2.8

SPECIMEN 090203

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	157.10	38.29	4.67E-04	1.1
5	154.59	24.14	3.59E-04	1.0
10	160.34	15.56	2.99E-04	0.7
15	165.47	18.89	1.96E-04	1.2
20	157.88	14.25	6.23E-05	2.2
80	160.90	18.89	6.22E-05	1.5
115	148.20	-2.39	6.26E-05	4.6
260	150.95	-0.26	6.20E-05	1.2
305	151.42	-5.37	6.07E-05	3.1
350	149.92	3.12	5.98E-05	2.9
450	154.41	12.03	5.88E-05	2.3
505	144.48	6.65	4.87E-05	3.1
520	144.82	9.40	6.79E-05	2.1
535	134.40	-16.16	3.80E-05	1.8
550	123.72	-13.55	2.98E-05	2.2
565	147.33	-4.77	3.07E-05	5.0
580	102.63	38.16	1.79E-05	5.4

SPECIMEN 090401

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	230.42	-24.10	1.23E-03	2.4
5	233.75	-30.21	8.17E-04	1.8
10	221.63	-6.22	4.70E-04	2.4
15	199.54	-5.47	3.03E-04	1.8
20	184.08	10.77	4.47E-05	1.6
1	172.10	0.29	3.49E-05	1.1
2	167.34	17.27	3.88E-05	1.1
3	183.57	14.52	3.24E-05	1.7
80	181.17	12.95	3.25E-05	1.0
115	174.78	16.31	3.32E-05	2.9
260	174.59	13.81	3.47E-05	1.3
305	171.71	13.10	3.40E-05	1.0
350	183.96	12.04	3.27E-05	2.2
450	175.32	14.05	3.20E-05	2.3
505	156.74	9.31	2.69E-05	1.2
520	168.64	1.89	2.74E-05	2.2
535	186.46	11.64	2.31E-05	3.9
550	173.74	17.95	1.88E-05	2.6
565	159.01	22.76	1.89E-05	1.9
580	195.77	17.12	1.65E-05	3.2

SPECIMEN 090403

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	178.68	32.08	1.79E-04	0.8
20	177.13	13.77	7.84E-05	0.9
30	162.48	26.10	2.67E-05	1.5
40	210.13	34.60	1.53E-05	3.1
50	216.96	43.58	1.34E-05	2.6
60	250.83	34.67	1.14E-05	2.8
70	263.24	61.96	8.85E-06	2.3
80	186.88	39.86	9.57E-06	2.2
90	269.72	30.38	5.14E-06	2.8
100	319.94	-66.94	5.02E-06	2.7
110	194.52	60.14	8.59E-06	2.6
120	280.64	8.77	4.73E-06	1.5

SPECIMEN 090501

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	155.82	42.55	6.51E-04	0.9
20	142.75	-6.09	9.89E-05	0.8
80	144.31	-5.55	9.90E-05	1.0
115	147.92	-3.75	9.92E-05	0.8
260	144.60	-4.55	1.02E-04	0.7
305	134.96	-7.95	9.82E-05	2.0
350	140.76	-6.14	1.01E-04	1.2
450	143.38	-4.99	9.90E-05	0.8
505	143.46	4.58	1.08E-04	0.7
520	149.22	2.21	8.63E-05	1.3
535	143.65	1.44	8.77E-05	1.3
550	143.39	6.60	8.37E-05	0.8
565	140.85	2.32	7.85E-05	0.8
580	25.91	-43.72	6.96E-06	5.0

SPECIMEN 090502

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	303.07	-1.69	2.15E-03	1.4
5	301.08	8.43	1.55E-03	1.9
10	317.56	-7.68	6.04E-04	1.4
15	226.66	-1.37	1.85E-04	1.5
20	167.61	13.39	9.20E-05	1.5
1	151.89	-0.25	7.11E-05	1.3
2	146.28	10.61	8.98E-05	1.1
3	161.29	12.92	7.87E-05	1.3
80	157.13	9.84	8.13E-05	1.6
115	151.28	6.67	7.96E-05	1.3
260	152.17	3.63	8.80E-05	1.6
305	152.84	5.04	8.90E-05	1.2
350	151.19	4.07	9.06E-05	2.4
450	163.05	11.64	8.09E-05	2.2
505	157.58	12.72	8.25E-05	1.3
520	147.20	13.27	8.54E-05	3.0
535	150.26	4.45	6.59E-05	1.1
550	145.25	6.95	6.64E-05	1.9
565	154.25	26.22	3.87E-05	1.6
580	149.63	34.07	3.09E-05	3.4

SPECIMEN 090603

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha95$
0	12.69	-19.55	7.38E-04	0.7
5	2.96	-15.39	6.08E-04	1.4
10	27.67	-1.83	2.24E-04	1.5
15	118.96	-4.97	1.08E-04	2.9
20	158.14	17.03	8.03E-05	0.9
80	156.76	15.85	8.03E-05	0.8
115	145.69	11.51	7.95E-05	5.3
260	158.55	4.98	8.70E-05	1.3
305	157.91	1.03	8.00E-05	4.9
350	151.20	-1.06	7.25E-05	1.9
450	165.98	7.20	6.21E-05	0.9
505	161.23	0.88	5.79E-05	4.9
520	163.20	4.18	5.49E-05	3.1
535	164.49	5.88	5.51E-05	2.3
550	148.58	16.28	4.80E-05	2.6
565	152.92	3.85	4.92E-05	3.8
580	135.59	61.14	7.75E-06	8.5

SPECIMEN 100101

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	152.84	15.15	4.11E-04	0.6
5	151.73	11.14	3.87E-04	0.7
10	158.51	6.80	3.55E-04	0.8
15	154.91	-6.52	1.73E-04	0.7
20	155.72	-2.40	7.57E-05	0.5
1	161.38	0.64	9.37E-05	0.6
2	156.94	15.36	6.11E-05	0.5
3	165.27	4.48	7.89E-05	0.3
80	167.39	1.02	7.98E-05	0.5
115	179.29	11.67	1.10E-04	1.7
260	172.56	7.32	1.52E-04	1.9
305	164.78	10.82	8.45E-05	0.6
350	167.91	-0.92	7.35E-05	1.5
450	160.45	3.73	6.92E-05	0.7
505	156.68	2.91	4.41E-05	0.7
520	202.04	8.31	4.26E-05	0.7
535	204.00	30.48	8.24E-06	6.2
550	90.43	-0.73	7.66E-06	10.6
565	204.71	1.95	6.05E-06	5.9
580	303.64	-27.95	7.69E-06	4.7

SPECIMEN 100102

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	155.62	9.07	3.23E-04	0.5
20	160.46	15.57	1.80E-04	0.3
30	173.72	3.06	7.56E-05	0.7
40	171.18	13.89	2.93E-05	0.5
50	176.63	27.31	2.73E-05	0.8
60	171.35	26.88	1.88E-05	1.1
70	178.38	36.30	1.87E-05	1.2
80	161.18	39.03	1.60E-05	1.6
90	162.07	33.26	1.42E-05	1.8
100	156.68	37.84	1.61E-05	1.4
110	190.50	29.62	1.11E-05	2.9
120	164.18	47.59	1.19E-05	2.4

SPECIMEN 100202

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	170.73	29.89	8.25E-05	0.4
5	168.10	19.93	7.11E-05	0.5
10	168.52	10.67	6.05E-05	0.9
15	170.37	9.34	3.64E-05	0.5
20	177.86	9.74	3.15E-05	0.4
80	173.73	11.85	3.17E-05	0.6
115	179.53	8.03	3.15E-05	1.1
260	176.23	10.06	3.23E-05	2.9
305	177.30	9.85	3.15E-05	2.2
350	182.49	7.23	2.97E-05	0.9
450	195.09	5.13	2.74E-05	0.8
505	189.13	12.65	2.25E-05	1.1
520	195.82	14.06	1.65E-05	2.2
535	183.15	16.14	1.16E-05	1.0
550	170.20	-17.48	8.46E-06	0.9
565	197.66	10.94	1.43E-05	0.3
580	117.73	47.71	1.01E-06	13.2

SPECIMEN 100302

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	165.95	4.02	3.15E-04	0.6
15	161.49	2.87	2.50E-04	0.4
20	177.49	-6.22	7.36E-05	0.3
80	173.45	-4.10	7.46E-05	0.5
115	170.80	-2.11	7.46E-05	0.5
260	175.47	-0.56	7.58E-05	0.4
305	177.77	2.66	8.69E-05	2.3
350	169.63	1.48	7.47E-05	0.8
450	180.61	-2.75	6.81E-05	0.5
505	181.93	-0.83	5.62E-05	0.4
520	177.58	0.30	4.79E-05	2.3
535	161.28	5.69	3.99E-05	1.9
550	273.35	71.31	3.58E-05	3.2
565	168.49	42.38	1.09E-05	4.7
580	343.47	40.46	1.08E-05	9.2

SPECIMEN 100402

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	158.77	17.94	5.13E-04	0.9
5	166.33	8.82	3.29E-04	1.0
10	163.86	10.58	2.36E-04	0.8
15	147.50	3.71	1.03E-04	1.3
20	166.80	7.23	4.15E-05	0.9
80	167.36	6.20	4.16E-05	0.8
115	169.47	4.41	4.11E-05	0.6
260	169.38	5.09	3.98E-05	2.3
305	179.76	5.87	4.33E-05	0.3
350	177.63	2.39	3.82E-05	0.4
450	183.72	-12.37	2.42E-05	0.8
505	109.29	-51.53	2.14E-05	2.7
520	203.04	10.82	3.00E-05	1.0
535	170.36	-4.08	2.84E-05	1.2
550	171.06	1.60	2.02E-05	1.0
565	195.26	-11.62	2.15E-05	1.2
580	351.77	49.40	6.86E-06	9.2

SPECIMEN 100501

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	177.99	-19.47	2.37E-03	0.7
5	177.94	-25.02	1.47E-03	1.1
10	171.74	-2.93	8.55E-04	0.7
15	176.32	-3.69	4.46E-04	1.6
20	174.56	1.24	6.87E-05	1.4
80	177.64	0.67	6.85E-05	1.5
115	173.00	0.75	6.88E-05	1.3
260	173.75	3.50	6.91E-05	1.5
305	174.91	4.53	6.47E-05	2.6
350	167.31	2.29	6.76E-05	2.0
450	169.87	4.82	5.40E-05	1.6
505	166.48	5.69	4.79E-05	1.2
520	174.83	9.65	4.89E-05	1.7
535	173.37	17.11	3.43E-05	1.7
550	262.10	43.17	2.24E-05	1.8
565	292.15	80.10	4.83E-06	9.2

SPECIMEN 100601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	162.57	-0.45	3.79E-04	0.5
20	158.74	12.03	2.41E-04	0.7
30	185.03	-3.51	9.54E-05	0.3
40	172.94	7.50	3.72E-05	0.9
50	174.68	22.78	3.48E-05	1.0
60	185.60	9.85	2.16E-05	1.5
70	176.24	33.20	2.58E-05	1.7
80	204.31	13.14	2.43E-05	1.4
90	171.18	-4.97	8.72E-06	5.2
100	165.96	39.37	2.15E-05	2.4
110	202.69	18.39	2.25E-05	1.6
120	81.84	-18.67	8.12E-06	8.2

SPECIMEN 100602

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	157.55	-2.86	4.41E-04	0.7
15	162.00	1.47	3.41E-04	0.5
20	161.69	-10.94	1.04E-04	1.2
1	178.38	-5.96	8.40E-05	0.4
2	140.42	26.11	6.28E-05	1.7
3	154.55	-5.42	5.03E-05	1.5
80	148.77	-0.80	4.82E-05	1.6
115	135.41	-7.61	4.50E-05	2.0
260	160.46	-1.94	5.83E-05	1.0
305	156.47	-3.11	5.86E-05	1.2
350	175.52	-3.45	6.18E-05	0.7
450	166.66	-15.39	5.11E-05	1.2
505	132.26	-26.09	6.45E-05	1.5
520	89.79	13.49	4.99E-05	2.1
535	144.97	-1.22	3.77E-05	2.6
550	143.63	-18.77	4.17E-05	2.6
565	144.37	-7.80	4.50E-05	3.2
580	135.61	-67.90	1.42E-05	7.1

SPECIMEN 100603

TEMP.	DECL.	INCLIN.	INTENSITY	α95
5	172.28	-6.07	2.20E-03	0.7
10	168.94	5.44	1.40E-03	0.7
15	139.91	-5.32	3.72E-04	1.1
20	151.22	-7.66	1.14E-04	0.9
80	150.62	-11.41	1.08E-04	0.9
115	154.96	-10.54	1.12E-04	1.0
260	152.46	-5.71	1.16E-04	0.8
305	153.78	-7.87	1.10E-04	0.8
350	146.87	-6.42	1.11E-04	2.1
450	154.89	-9.85	8.69E-05	1.3
505	140.39	-13.28	6.01E-05	1.8
520	135.12	11.00	7.89E-05	1.6
535	155.31	-15.33	7.66E-05	0.9
550	142.76	-14.53	5.89E-05	1.3
565	145.55	-9.88	5.31E-05	3.4
580	142.99	3.68	4.25E-05	1.8

SPECIMEN 110101

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	170.23	14.01	9.88E-05	0.9
20	155.94	2.81	6.75E-05	1.5
30	163.56	24.85	3.64E-05	0.9
40	160.16	38.64	2.66E-05	0.8
50	160.52	10.43	2.47E-05	1.4
60	178.63	37.81	1.90E-05	0.7
70	293.41	67.98	9.56E-06	2.2
80	132.65	-5.00	2.08E-05	1.7
90	183.18	36.54	1.58E-05	0.9
100	330.37	16.28	1.22E-05	2.2
110	144.44	-15.32	2.32E-05	1.8
120	175.23	30.53	1.20E-05	1.4

SPECIMEN 110102

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	85.18	-0.28	6.57E-05	1.2
5	96.62	-2.41	7.35E-05	1.1
10	117.02	9.37	7.55E-05	1.1
15	144.73	13.65	7.32E-05	1.6
20	158.18	26.52	5.00E-05	1.6
1	157.16	26.45	4.66E-05	1.2
2	150.16	27.93	4.95E-05	1.1
3	153.53	27.64	4.80E-05	1.3
80	157.20	20.44	4.79E-05	1.2
115	155.93	18.34	4.80E-05	1.5
260	157.81	15.34	4.95E-05	1.3
305	154.33	15.41	4.79E-05	1.5
350	157.97	14.78	4.60E-05	2.4
450	157.26	13.69	3.92E-05	2.2
505	159.52	17.19	3.29E-05	1.5
520	147.90	19.83	2.90E-05	2.3
535	148.22	22.13	2.67E-05	5.3
550	178.90	23.58	9.10E-06	1.7
565	170.58	38.44	1.06E-05	2.1
580	143.05	64.86	2.58E-06	3.6

SPECIMEN 110203

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	31.07	-5.24	9.56E-05	1.1
5	38.01	-6.06	9.01E-05	2.2
10	51.05	4.89	6.93E-05	1.2
15	97.04	9.10	4.19E-05	1.8
20	128.13	25.16	4.03E-05	2.8
80	127.74	20.08	3.91E-05	1.2
115	130.52	20.03	3.94E-05	2.3
260	133.33	9.20	4.34E-05	3.1
305	142.19	9.57	4.27E-05	1.2
350	149.80	18.38	4.41E-05	0.9
450	153.06	15.14	3.59E-05	0.9
505	154.26	15.52	3.34E-05	2.2
520	161.21	15.76	2.77E-05	1.9
535	167.69	20.72	1.71E-05	2.2
550	214.40	70.03	6.65E-06	3.8
565	156.55	23.80	3.99E-06	4.2
580	165.40	51.78	2.14E-06	6.5

SPECIMEN 110301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	194.60	23.24	3.64E-04	0.6
20	161.03	23.35	1.76E-04	1.5
30	168.51	5.06	5.75E-05	1.1
40	168.10	18.80	2.64E-05	1.8
50	172.01	38.58	3.08E-05	1.5
60	137.83	14.50	1.80E-05	2.1
70	241.49	36.93	1.19E-05	1.0
80	172.29	37.96	2.64E-05	1.4
90	129.34	2.51	1.63E-05	1.6
100	295.37	-27.18	8.02E-06	1.9
110	169.61	37.09	2.82E-05	1.5
120	120.46	-7.09	1.49E-05	1.6

SPECIMEN 110302

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	199.89	19.56	3.65E-04	0.7
5	184.83	19.63	3.33E-04	0.7
10	173.98	10.99	2.88E-04	1.0
15	153.13	3.56	1.94E-04	1.0
20	157.50	5.65	7.20E-05	2.1
1	159.07	0.00	7.27E-05	1.0
2	150.21	-4.50	6.23E-05	2.3
3	151.72	-0.57	6.24E-05	2.5
80	153.90	-6.77	6.54E-05	2.8
115	158.64	-6.80	6.69E-05	1.0
260	157.33	-4.75	6.77E-05	1.5
305	162.53	-6.18	6.54E-05	0.6
350	154.43	-7.50	6.31E-05	2.7
450	160.66	-5.29	5.74E-05	0.9
505	157.99	0.55	5.29E-05	3.7
520	157.53	-17.27	3.80E-05	1.5
535	169.20	-3.89	4.39E-05	0.9
550	163.25	-3.99	3.49E-05	1.7
565	137.28	-26.45	1.78E-05	2.6
580	304.96	57.02	1.98E-05	1.5

SPECIMEN 110402

TEMP.	DECL.	INCLIN.	INTENSITY	α95
20	152.69	14.50	7.79E-05	0.8
80	146.26	9.21	7.99E-05	1.6
115	161.20	10.42	7.85E-05	1.5
260	156.46	8.76	8.13E-05	1.0
305	141.82	8.11	7.96E-05	0.8
350	145.10	8.86	7.37E-05	2.7
450	146.82	10.38	7.27E-05	2.3
505	145.40	11.07	6.14E-05	1.9
520	153.25	25.80	7.56E-05	1.3
535	154.66	8.29	5.64E-05	2.5
550	141.33	19.44	2.55E-05	2.5
565	160.35	65.49	1.71E-05	1.9
580	139.42	68.13	1.10E-05	2.3

SPECIMEN 110502

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	171.21	15.50	4.26E-04	0.7
5	165.13	10.00	3.94E-04	1.0
10	161.91	4.87	3.85E-04	0.9
15	167.64	8.92	3.17E-04	0.5
20	151.50	-0.37	1.17E-04	4.8
80	157.16	2.88	1.19E-04	1.1
115	169.22	12.31	1.20E-04	0.8
260	160.26	5.92	1.19E-04	0.8
305	161.45	6.04	1.21E-04	1.0
350	155.67	1.83	1.16E-04	2.7
450	158.09	5.68	1.09E-04	1.1
505	158.72	5.16	9.88E-05	1.1
520	157.87	4.71	9.92E-05	3.0
535	156.38	3.63	9.65E-05	1.7
550	159.09	3.84	8.11E-05	1.3
565	163.76	15.35	1.03E-05	3.6
580	38.07	-1.09	2.18E-06	12.2

SPECIMEN 110601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	160.53	1.88	4.09E-04	0.8
15	156.31	-0.78	3.57E-04	1.9
20	154.54	2.67	1.22E-04	1.9
80	163.05	6.82	1.24E-04	0.7
115	153.65	0.17	1.23E-04	1.2
260	146.54	-2.55	1.23E-04	1.3
305	154.16	0.64	1.27E-04	1.5
350	155.93	3.81	1.27E-04	0.9
450	157.90	5.42	1.19E-04	1.7
505	152.18	3.52	1.03E-04	1.3
520	154.25	4.50	1.06E-04	1.5
535	142.42	-4.33	1.06E-04	1.6
550	251.61	29.49	8.11E-06	6.1
565	109.84	55.10	2.94E-06	17.5
580	100.69	-42.05	7.33E-06	4.6

SPECIMEN 110602

TEMP.	DECL.	INCLIN.	INTENSITY	α95
20	167.41	3.83	1.25E-04	0.7
30	158.32	5.79	9.42E-05	0.9
40	176.85	16.98	4.99E-05	1.0
50	153.54	14.62	3.41E-05	2.5
60	191.64	28.32	1.69E-05	3.8
70	160.57	16.48	1.66E-05	3.0
80	168.07	17.66	1.92E-05	2.7
90	137.13	6.09	1.19E-05	6.3
100	182.43	-37.20	1.09E-05	5.4
110	147.89	-26.44	1.16E-05	4.6
120	179.84	-47.56	1.28E-05	6.1

SPECIMEN 110603

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	270.27	-9.71	1.70E-03	1.0
20	272.44	14.33	4.94E-04	1.1
30	274.05	4.63	9.28E-05	1.1
40	183.75	18.23	4.51E-05	0.9
50	170.37	26.92	3.92E-05	0.8
60	158.26	20.09	2.82E-05	1.5
70	169.55	29.84	2.83E-05	1.2
80	154.96	15.95	2.67E-05	1.8
90	149.81	12.63	2.67E-05	1.7
100	157.29	22.24	2.56E-05	1.3
110	148.94	13.05	2.17E-05	1.8
120	162.08	-25.60	9.24E-06	3.0

SPECIMEN 120101

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
0	266.31	12.58	1.08E-03	1.2
5	274.31	11.04	7.71E-04	1.1
10	262.40	11.98	3.99E-04	1.5
15	208.13	19.24	1.68E-04	1.6
20	180.32	27.25	5.66E-05	1.1
80	167.17	25.01	5.74E-05	0.9
115	170.19	25.33	5.69E-05	1.0
260	172.81	26.53	5.71E-05	0.9
305	174.71	26.12	5.79E-05	1.2
350	174.89	28.20	5.53E-05	1.7
450	169.37	29.32	4.96E-05	1.5
505	175.45	36.35	3.92E-05	1.2
520	179.06	33.94	4.34E-05	1.1
535	166.88	34.66	3.67E-05	1.2
550	137.57	24.96	3.56E-05	1.2
565	176.57	45.33	1.87E-05	2.2
580	294.18	-19.88	3.19E-06	10.3

SPECIMEN 120301

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
10	67.50	-11.45	6.96E-04	1.0
15	134.29	24.29	6.59E-11	77.4
15	93.09	8.72	2.57E-04	0.7
20	138.14	23.60	7.35E-05	0.9
1	139.15	36.58	8.58E-05	1.0
2	152.41	12.34	6.12E-05	1.6
3	155.92	27.78	5.66E-05	1.5
80	148.29	25.84	5.58E-05	1.3
115	148.31	21.53	5.85E-05	1.3
260	154.89	20.79	6.45E-05	1.3
305	151.92	21.71	6.64E-05	1.3
350	154.51	31.26	6.46E-05	1.3
450	161.96	24.13	6.95E-05	1.5
505	183.53	17.29	4.89E-05	1.8
520	172.35	16.67	5.99E-05	1.3
535	168.35	28.71	2.63E-05	3.1
550	289.59	15.05	8.45E-06	6.5
565	304.95	-40.97	7.39E-06	9.4
580	161.34	34.44	4.18E-06	15.5

SPECIMEN 120401

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
10	200.69	62.17	4.21E-04	1.7
15	178.49	25.90	2.54E-04	1.2
20	164.09	24.47	1.17E-04	1.2
80	162.11	23.97	1.16E-04	1.1
115	164.09	24.44	1.17E-04	1.4
260	171.65	28.95	1.13E-04	1.6
305	161.05	22.93	1.25E-04	1.7
350	166.26	27.06	1.32E-04	1.3
450	163.52	22.67	1.10E-04	1.3
505	170.57	24.13	1.10E-04	1.3
520	36.90	12.13	2.74E-05	3.5
535	158.48	22.68	8.75E-05	1.3
550	174.98	20.01	7.68E-05	1.6
565	119.49	42.52	7.24E-06	8.9
580	6.71	-4.59	7.39E-06	8.6

SPECIMEN 120402

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
0	130.59	20.80	7.72E-04	2.3
80	133.73	17.61	7.39E-04	2.5
115	131.00	14.88	7.08E-04	4.6
260	134.98	4.03	6.43E-04	1.6
305	136.98	1.53	6.29E-04	1.6
350	132.57	-1.79	6.10E-04	1.7
450	137.82	-3.29	5.27E-04	3.8
505	143.36	-2.76	4.55E-04	1.8
520	271.72	-6.03	9.49E-06	22.4

SPECIMEN 120403

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
5	64.29	16.18	2.73E-03	1.8
10	52.06	27.71	1.49E-03	2.0
15	6.63	43.84	8.76E-04	1.4
20	316.38	70.90	2.29E-04	0.9
80	314.80	72.29	2.29E-04	0.8
115	306.16	76.69	2.30E-04	2.7
260	320.76	69.29	2.31E-04	0.9
305	305.37	70.96	2.20E-04	0.9
350	296.84	73.82	2.20E-04	0.8
450	286.51	80.10	1.94E-04	1.1
505	300.93	74.22	1.66E-04	0.9
520	269.28	71.86	1.68E-04	1.0
535	303.75	67.19	9.59E-05	0.7
550	334.01	52.24	7.40E-05	0.7
565	253.48	76.89	7.96E-05	2.4
580	178.34	61.44	1.23E-05	6.7

SPECIMEN 120501

TEMP.	DECL.	INCLIN.	INTENSITY	$\alpha 95$
0	132.33	37.32	5.11E-05	0.6
5	141.28	34.59	4.62E-05	2.3
10	150.61	33.05	4.16E-05	0.9
15	160.75	33.73	3.70E-05	0.7
20	154.73	37.95	3.23E-05	1.1
80	156.36	34.00	3.14E-05	0.8
115	157.20	33.60	3.15E-05	1.2
260	153.26	31.44	3.19E-05	0.5
305	154.39	31.09	3.13E-05	1.0
350	159.21	28.66	3.17E-05	0.5
450	163.18	37.22	2.32E-05	0.7
505	163.51	38.27	1.97E-05	1.3
520	160.29	37.47	2.57E-05	0.4
535	168.37	42.90	1.67E-05	0.4
550	170.71	40.44	1.62E-05	0.5
565	174.37	44.09	1.16E-05	0.5
580	170.98	42.54	9.59E-06	0.4

SPECIMEN 130102

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	192.15	58.76	2.21E-04	1.6
5	169.91	53.58	2.33E-04	1.3
10	159.80	20.80	2.06E-04	0.6
15	161.63	14.06	1.51E-04	1.2
20	153.81	9.79	8.30E-05	0.7
80	150.98	9.33	8.32E-05	0.8
115	148.63	9.59	8.30E-05	0.7
260	149.72	10.84	8.37E-05	1.8
305	150.07	8.92	8.69E-05	0.6
350	154.37	7.55	8.38E-05	0.9
450	160.57	8.87	7.87E-05	0.9
505	153.43	9.08	6.80E-05	2.3
520	147.80	7.40	7.00E-05	3.1
535	155.81	-1.55	3.66E-05	2.9
550	145.11	0.22	4.36E-05	1.6
565	148.95	-7.59	4.45E-05	2.6
580	245.62	72.55	5.28E-06	11.5

SPECIMEN 130201

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	193.59	-30.07	2.86E-04	2.5
5	181.93	-19.46	2.17E-04	0.9
10	167.38	8.72	1.67E-04	1.1
15	148.62	11.71	1.05E-04	1.0
20	157.11	23.91	5.53E-05	1.6
80	134.82	21.37	5.54E-05	2.9
115	152.94	23.03	5.57E-05	1.3
260	151.84	24.32	5.62E-05	1.4
305	153.64	24.66	5.62E-05	1.3
350	148.73	24.56	5.72E-05	1.3
450	146.49	23.38	5.43E-05	1.6
505	144.58	26.06	4.65E-05	1.7
520	156.76	27.41	3.71E-05	1.9
535	141.43	26.79	3.54E-05	3.4
550	133.39	16.65	5.08E-05	1.2
565	165.17	19.55	3.47E-05	2.7
580	43.45	-69.24	4.95E-06	8.3

SPECIMEN 130301

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	151.47	65.92	3.62E-04	1.2
20	150.52	9.84	1.32E-04	0.6
30	133.61	16.55	7.60E-05	1.1
40	156.02	26.55	4.08E-05	1.3
50	148.32	34.66	3.12E-05	1.8
60	151.75	28.52	3.02E-05	1.4
70	147.81	37.07	1.49E-05	2.0
80	170.12	39.01	1.41E-05	2.7
90	135.57	11.39	2.00E-05	3.2
100	132.96	-6.20	6.24E-06	6.3
110	227.95	50.18	4.89E-06	10.9
120	141.29	2.64	1.55E-05	3.7

SPECIMEN 130403

TEMP.	DECL.	INCLIN.	INTENSITY	α95
80	168.63	23.65	9.31E-05	0.6
115	162.17	21.80	9.24E-05	1.5
260	172.74	23.56	9.33E-05	0.6
305	168.51	22.36	9.68E-05	2.1
350	171.55	22.51	9.91E-05	0.7
450	176.35	24.71	9.35E-05	1.0
505	162.97	12.31	7.81E-05	1.6
520	163.29	31.71	1.22E-04	1.7
535	154.30	21.74	7.55E-05	2.1
550	151.80	19.00	7.35E-05	2.1
565	152.54	4.21	4.39E-05	3.3
580	167.88	52.82	1.84E-05	3.7

SPECIMEN 130501

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	308.35	42.58	2.56E-04	0.6
15	320.27	27.42	1.65E-04	1.2
20	302.91	28.20	5.71E-05	1.0
1	294.57	18.81	4.44E-05	1.3
2	325.21	34.61	5.36E-05	1.5
3	324.13	47.06	4.94E-05	1.3
80	300.34	43.37	4.83E-05	1.6
115	313.68	44.52	4.90E-05	1.3
260	308.12	40.01	4.98E-05	1.8
305	314.54	41.21	5.39E-05	1.7
350	286.45	33.65	4.90E-05	1.3
450	305.08	39.60	5.40E-05	1.5
505	297.99	32.06	3.76E-05	2.7
520	274.59	53.88	3.46E-05	1.7
535	309.90	30.62	3.85E-05	1.3
550	35.38	-47.77	4.45E-06	11.9
565	324.43	16.65	4.44E-06	10.4
580	297.59	71.81	9.95E-06	6.1

SPECIMEN 130503

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	15.43	36.42	1.02E-03	0.5
20	13.64	41.04	3.63E-04	0.7
30	340.19	57.88	1.53E-04	2.1
40	296.43	68.90	6.85E-05	1.4
50	280.56	52.47	2.54E-05	2.5
60	323.25	27.93	1.81E-05	3.9
70	2.42	53.41	9.86E-06	7.5
80	243.46	43.07	1.10E-05	5.6
90	350.41	-9.49	7.86E-06	7.3
100	50.44	50.86	9.55E-06	6.4
110	203.96	27.32	1.39E-05	2.6
120	319.04	-23.51	9.50E-06	5.5

SPECIMEN 130601

TEMP.	DECL.	INCLIN.	INTENSITY	α95
10	87.14	36.95	3.04E-04	0.5
15	78.76	5.37	2.57E-04	0.7
20	82.79	10.11	8.70E-05	1.8
80	85.52	9.38	8.77E-05	0.5
115	108.99	-0.37	8.79E-05	0.7
260	85.70	13.38	8.87E-05	3.5
305	87.27	11.02	9.45E-05	0.5
350	91.18	4.17	9.17E-05	0.6
450	95.99	11.12	9.11E-05	0.5
505	95.86	11.69	9.36E-05	0.8
520	86.04	13.06	8.28E-05	1.5
535	89.14	18.72	7.47E-05	3.3
550	48.24	69.78	3.55E-05	3.9
565	31.92	13.85	1.77E-05	2.7
580	110.19	-75.53	9.62E-06	8.0

SPECIMEN 130602

TEMP.	DECL.	INCLIN.	INTENSITY	α95
0	23.95	36.55	1.03E-03	1.4
5	47.06	39.21	6.51E-04	0.6
10	57.67	16.50	4.27E-04	1.4
15	82.58	20.04	1.69E-04	0.9
20	78.79	6.68	8.50E-05	0.6
1	83.31	26.82	6.56E-05	1.3
2	79.72	16.49	9.66E-05	0.6
3	74.09	7.04	7.62E-05	3.2
80	80.83	3.13	7.69E-05	0.7
115	84.02	2.23	7.86E-05	0.9
260	94.48	-0.71	8.07E-05	0.6
305	92.45	6.21	6.78E-05	1.2
350	85.06	8.90	7.68E-05	1.0
450	84.13	7.94	7.39E-05	2.0
505	72.39	-2.22	5.31E-05	2.2
520	60.71	-4.62	6.40E-05	1.7
535	79.73	8.12	6.56E-05	3.3
550	83.50	13.43	6.26E-05	2.2
565	105.76	33.64	3.99E-05	2.1
580	207.94	64.75	1.32E-05	8.9

Curriculum Vitae

Halima S. Warsame

Education

2015–present	M.Sc.	The University of Western Ontario Geology
2010–2015	B.Sc.	The University of Western Ontario Major in Biology | Major in Geology

Research Interests

Paleomagnetism
Paleogeography
Paleoecology

Honours, Awards and Scholarships

2017	Jerome H. Remick Poster Awards (*honorable mention*)
2017	Western Graduate Research Scholarship
2017	Graduate Student Teaching Award of Excellence (nomination)
2016	Western Graduate Research Scholarship
2015	Western Graduate Research Scholarship

Conference Presentations

2017 **Warsame, H.S**., McCausland, P.J.A., White, C.E., Barr, S.M. and Dunning, G.R. Age and paleomagnetic assessment of the Mavillette gabbro, Meguma terrane, Nova Scotia, Canada. Geological and Mineralogical Association of Canada.

2016 Warsame, H.S., **McCausland, P.J.A.** and Waldron, J.W.F. Reassessment of Port au Port Peninsula Paleomagnetism, with new preliminary results. Geological and Mineralogical Association of Canada.

2016 **Warsame, H.S**., McCausland, P.J.A. and Waldron, J.W.F. Paleomagnetic Reassessment of the Early Paleozoic Carbonate Rocks of the Port au Port Peninsula, Newfoundland, Canada. Atlantic Geoscience Society.

Lab Experience

2017 Teaching Assistant – Earth Sciences 1022B: Earth Rocks

2016 Teaching Assistant – Earth Sciences 2240F: Catastrophic Events in Earth's History

2016 Teaching Assistant – Earth Sciences 1089G: Earth, Art & Culture

2015 Teaching Assistant – Earth Sciences 1022A: Earth Rocks

2015–2017 Western Paleomagnetic and Petrophyiscal Laboratory
Geology research assistant focused on paleogeographical projects using paleomagnetic techniques

2015 Geology 9564A: Basin Analysis & Sequence Stratigraphy
Utilized seismic sections in order to determine basin-forming mechanisms. Analyzed sequence stratigraphic models to determine key stratigraphic surfaces, system tracts & chronostratigraphy.

2015 Earth Sciences 2230B: Introduction to Geochemistry
Applied the principles of radioisotope and stable isotope chemistry.

2015 Earth Sciences 3314B: Sedimentary Petrology
Identified and interpreted ancient sedimentary rocks. Determined ancient depositional environments and alteration processes.

2014 Earth Sciences 2260A: Stratigraphy and Sedimentology
Correlated well logs and analyzed seismic stratigraphic data.

2014	Earth Sciences 2206A: Mineralogy, Crystallography, and Optics Used microscopes to examine mineral chemistry, crystal chemistry and mineral paragenesis through the identification of minerals and mineral properties in thin section.
2014	Earth Sciences 2265A: Paleobiology and Paleoecology Surveyed the fossil record from bacteria, protista, algae and invertebrates to determine morphology, evolutionary trends and paleoenvironments.
2013–2015	Work Study Student (Sinclair Lab) Investigated the potential of the invasive species, the spotted-winged *Drosophila,* to establish as a significant pest in Ontario.
2013	Biology 2601A: Organismal Physiology Examined mechanisms and consequences of physiological processes in plants and animals.
2012	Biology 2290F: Scientific Method in Biology Used the technical and conceptual tools required to generate, analyze and communicate data from experimental investigations in cell biology, population biology and genetics.
2011	Chemistry 2213A: Organic Chemistry for Life Sciences Introduced to the basic concepts of structure, stereochemistry and reactions in organic chemistry in connection to their implications on medical sciences.

Relevant Coursework

Earth Sciences

Ancient Ecosystems	90%
Stable Isotope Geochemistry in Earth and Environmental Sciences	80%
Basin Analysis & Sequence Stratigraphy	78%
Introductory Field Mapping Techniques	78%
Introduction to Geochemistry	81%
Sedimentary Petrology	81%
Stratigraphy and Sedimentology	80%
Mineral Systems, Crystallography, and Optics	80%
Paleobiology and Paleoecology	81%
Plate Tectonic Theory, Environments and Products	88%
Catastrophic Events in Earth History	86%

Biology

Scientific Method in Biology	80%
Restoration Ecology	91%

Selected Papers

2017 “A faunal provinciality review of Laurentia and peri-Gondwanan terranes through the Lower Paleozoic ”
Geology 9532B: Ancient ecosystems

2016 “Oxygen and hydrogen isotope systematics of the Great Lakes ”
Geology 9506A: Stable Isotope Geochemistry in Earth and Environmental Sciences

2015 “The Fundy Basin: a consequence of Triassic-Jurassic rifting and the opening of the Atlantic Ocean”
Geology 9564A: Basin Analysis and Sequence Stratigraphy

2015 “Determining the origin life: a geochemical analysis of organic rich meteorites”
Earth Sciences 2230B: Introduction to Geochemistry

2015 “The evolution of mammalian features in therapsids during the Permian and Triassic Periods ”
Earth Sciences 2266G: Dinosaur and other Vertebrate Evolution

2014 “The eruption of Toba”
Earth Sciences 2240G: Catastrophic Events in Earth History

2014 “The inundation of North American coasts”
Earth Sciences 2240G: Catastrophic Events in Earth History

2014 “Natural vs. anthropogenic sources of aluminum and their concentrations in the atmosphere, soil and water”
Earth Sciences 3341B: Waters and Geochemical Cycles

2013 “Effect of acclimation temperature on oxygen consumption in the crayfish, *Orconectes propinquus*”
Biology 2601A: Organismal Physiology

2013 “Effect of temperature on oxygen consumption of the mouse, *Mus musculus*”
Biology 2601A: Organismal Physiology

2013 “The effects of cold stress on photosynthesis in Barley, *Hordeum vulgare*”
Biology 2601A: Organismal Physiology

2013 “CASO Restoration Plan – Section 11, Highgate Prairie”
Biology 3222F: Restoration Ecology

2012 “Photoreduction of 2, 6-dichlorophenolindophenol in damaged, illuminated spinach chloroplasts by diphenylcarbazide”
Biology 2290F: Scientific Method in Biology

2012 "Effects of common antibacterial products on the growth of M*icrococcus luteus*"
Biology 2290F: Scientific Method in Biology