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Use of Surface Vibrations for Drag Reduction and Alternative Propulsion

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Use of Surface Vibrations for Drag Reduction and Alternative Propulsion

Fluid transport caused by compression & expansion of a flexible tube or channel under the effect of travelling waves is known as Peristalsis. It is the inherent mechanism in human body by which urine flows from kidney to bladder, food moves through the digestive tract, ovum is transported through fallopian tubes etc. Inspired by this physiological mechanism, roller pumps have been developed to pump blood, corrosive fluids etc. or for other industrial purposes when it is desirable to prevent the transported fluid from coming in contact with the mechanical parts of the pump. My current research is focused on developing an efficient propulsion system that is driven by the peristaltic effect. I am numerically exploring the potential of vibration generated by piezo-electric-like elements in producing a propulsive force that will either result in drag reduction or propulsion augmentation.