Abstract Submitted
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Tree-inspired Piezoelectric Energy Harvesting WILLIAM HOBBS, Georgia Institute of Technology, DAVID HU — We design and build a tabletop wind energy harvester inspired by the swaying of trees. The device consists of cantilevered cylinders ("tree trunks") arranged linearly downwind. The bases of the cylinders contain piezoelectric transducers that capture energy from vibration of the cylinder transverse to the flow. For a particular Reynolds number, and ratio of vortex shedding frequency to cylinder natural frequency, we experimentally measure the power generated ($\sim$ 1 micro-watt) as a function of cylinder arrangement. We report optimal spacings for generating peak power. We also report the distribution of power down the array. We qualitatively account for these trends using flow visualizations of vortex shedding using a flowing soap film dynamically matched with our piezoelectric system.

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