Abstract Submitted
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A feasibility study on the potential for employing piezoelectric cantilever beams as vortex flow sensors[1] AMIR DANESH-YAZDI, Rose-Hulman Institute of Technology, OLEG GOUSHCHA, Manhattan College, YIANNIS ANDREOPOULOS, City College of New York — The Train of Frozen Boxcars (TFB) model was previously developed to study the effective one-way coupling of the force due to the advection of a vortex or train of vortices over a stiff piezoelectric cantilever beam. The TFB approach involves the advection of several boxcars of different amplitudes, widths and separations as a model for the fluidic force acting on the beam. In this talk, we explore utilizing the TFB model as a way to deduce the force that acts on the piezoelectric beam due to the vortex and study its potential for predicting properties associated with vortex flow such as vortex circulation, diameter and separation between vortices. Preliminary results indicate that while the original TFB model can predict the properties of an individual vortex rather well, the model requires tweaks in order to better predict vortex properties when a train of vortices are involved.

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