

Abstract Submitted
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Response of Flexible Cantilevered Cylinders in Wind JENNIFER CARDONA, Stanford University, JOHN DABIRI, California Institute of Technology — We present an experimental investigation of cantilevered flexible cylinders rigidly mounted in a wind tunnel. Many examples of flow-structure interactions (including plants in the wind) may be represented more closely by flexible cantilevered cylinders than by the canonical elastically mounted rigid cylinder in a crossflow. However, cantilevered cylinders have been less often studied, and prior work analyzing the response of flexible cantilevered cylinders has focused mainly on cylinders of low mass ratio for which it is known that synchronization of structure vibration and vortex shedding occurs over a broader range of reduced velocities. Here, the response of flexible cantilever cylinders will be presented and compared to previously observed responses of cylinders in cross flow due to vortex-induced vibrations including cantilevered cylinders with lower mass ratios. Understanding of responses due to fluid-structure interactions like this may be useful toward applications such as visual anemometry, in which visual observations of a structure undergoing wind loading are used to approximate wind speed.

Jennifer Cardona
Stanford University

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