

Abstract Submitted  
for the DFD14 Meeting of  
The American Physical Society

**Flow-induced oscillations of tandem tethered cylinders in a channel flow**<sup>1</sup> GARY NAVE, TYLER MICHAEL, Virginia Tech, PAVLOS VLACHOS, Purdue University, MARK STREMLER, Virginia Tech — In single degree-of-freedom (DOF) flow-induced oscillation studies of tandem rigid cylinders, the system most often consists of a front fixed cylinder and a trailing cylinder that is constrained to move perpendicular to the flow. We have conducted experiments in a water channel to investigate the behavior of a single DOF system of cylinders in which the trailing cylinder is constrained to move in a circular arc about the leading cylinder. We will discuss the dynamic response of the trailing cylinder for Reynolds numbers ranging from 10,000 to 20,000 and for inter-cylinder spacings from  $3D$  to  $5D$ , where  $D$  is the diameter of the cylinders. The experiments show a multi-frequency response that cannot be classified as a simple harmonic oscillator, as is assumed in typical tandem cylinder models. We compare our results with existing work on transversely constrained cylinders to determine the effect of tethering the cylinders.

<sup>1</sup>Work made possible by funding from the Virginia Commonwealth Research Commercialization Fund

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Date submitted: 01 Aug 2014

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