Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

**Controlling the forces on tandem stationary cylinders using oscillatory rotational motion** RAVI CHAITHANYA MYSA, Singapore University of Technology and Design, DOMINIC DENVER JOHN CHANDAR, Queen's University Belfast, VINH-TAN NGUYEN, Institute of High Performance Computing, A*STAR, PABLO VALDIVIA Y ALVARADO, Singapore University of Technology and Design — In a typical tandem circular cylinder set-up where the cylinders are held fixed, the forces acting on the downstream cylinder are primarily due to its own vortex shedding as well as the vortex interaction from the upstream cylinder. The upstream vortex upon interacting with the downstream cylinder displaces the boundary layer on it, which then leads to larger forces on the downstream cylinder compared to the case of an isolated cylinder. The movement of the stagnation point can however be controlled in a smart way by rotating the downstream cylinder in an appropriate manner. An oscillatory rotational motion with a frequency corresponding to the Strouhal frequency of the upstream cylinder is specified. However, the amplitude and phase of this rotational motion is actively monitored so that the forces on the downstream cylinder are controlled. A detailed analysis using the flow contours is conducted to explain the effect of oscillatory rotation motion on the forces of the downstream cylinder. Numerical simulations are performed at Reynolds number of 100 as well as at 0,000. This study will help in developing active feedback control for determining the forces acting on the downstream cylinder.

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Date submitted: 02 Aug 2019 Electronic form version 1.4