Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

An experimental study of flow past two rotating cylinders SANJAY KUMAR, BENITO GONZALEZ, Department of Engineering, The University of Texas at Brownsville, OLIVER PROBST, Physics Department, Technologico de Monterry (Mexico) — Flow past two uniformly rotating cylinders in a side-by-side configuration is studied experimentally at Reynolds numbers, Re, varying from 100 to 500 and the ratio of surface speed of cylinder to the free stream velocity, α, varying from 0 to 5. The center-to-center spacing between the cylinders, T, normalized by the cylinder diameter, D are 1.8, 2.5, 4.0, and 7.5. Two possibilities of rotations are considered with the cylinder surfaces in between the two cylinders moving upstream in one case (inward rotation case) and downstream in the other (outward rotation case). The diagnostics is done by flow visualization and particle-image-velocimetry. Vortex shedding is found to be suppressed in the inward rotation cases for $Re = 200$ to 500 and all spacing ratios at $\alpha = \alpha_s \sim 2.0$. The value of α_s for Re of 100 in this case increases from 1.2 to1.7 as T/D increases from 1.8 to 4.0 and does not increase further with T/D. For outward rotation cases, vortex shedding suppression is observed for Re of 100 and for all values of T/D; however, for higher Re, suppression is observed for T/D of 4.0 and 7.5 only. The measurements of α_s in this case showed a decreasing trend with increasing T/D. Symmetry breaking in the wake is reported for inward rotation case near $\alpha_s = 1.35$ for the case of $T/D = 2.5$ at Re of 200.

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Date submitted: 04 Aug 2010 Electronic form version 1.4