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An Experimental Study of Flow Around a Spinning Cylinder¹ CESAR CANTU, BENITO GONZALEZ, SANJAY KUMAR, Department of Engineering, The University of Texas at Brownsville, TX-78520 — Flow around a single spinning circular cylinder is studied experimentally. The experiments are carried out in a free-surface water tunnel at Reynolds numbers (Re) of 200, 300, and 400 and non-dimensional rotation rates (ratio of surface speed of cylinder to free stream velocity), α , varying from 0 to 5. The diagnostics was done by flow visualization using hydrogen bubble technique. We present the global view of the wake structure at the three Reynolds numbers and various rotation rates. Vortex shedding suppression is observed for $\alpha \sim 2.0$. Experimental evidence of the vortex shedding in the second vortex shedding regime (4.34 < α < 4.70) (S. Mittal and B. Kumar, J.Fluid Mech., 2003) is presented for the first time at Re=200. Strouhal number (St) measurements and global wake patterns agree well with the computations of Mittal and Kumar (2003) at Reynolds number of 200. Strouhal number measurements in the Reynolds number range and rotation rates indicate that at low values of α (~ α <1.2) St increases with Re while for larger values of α (~1.2< α <2.0), St decreases with Re.

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