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Near Wake of a Circular Cylinder Undergoing Yaw Oscillation at Subcritical Flow VAHID NASR ESFAHANI, RONALD HANSON, York University, ALIS EKMEKCI, University of Toronto — In this experimental study the near wake of a circular cylinder undergoing yaw oscillation is investigated. The yaw angle is varied from a crossflow (0^o) to 30^o. Two different Reynolds numbers of 5×10^3 and 1.5×10^4 are considered. Planar Particle Image Velocimetry measurements are used to study the flow topology in the near wake at the midspan of the cylinder, which corresponds to the center of yaw oscillation. Flow field measurements are obtained for a range of reduced frequencies based on the cylinder length, freestream velocity and oscillation frequency. The flow field results and wake parameters are compared to a baseline static cylinder at corresponding yaw angles. It is found that various wake parameters, such as the wake closure length or wake width vary with reduced frequency. As the reduced frequency is increased the wake closure length tends to decrease. For low to moderate reduced frequencies, the vortex shedding can be suppressed at high yaw angles. For the highest values of reduced frequency considered in this study the mean recirculation region can be suppressed throughout the oscillation cycle.

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