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**Effect of Fluid Structure Interaction on the Wake Structure of a Thin Flexible Cylinder** HARIKA GURRAM, CHELAKARA SUBRAMANIAN, PRIYANKA KANHERKAR, Florida Institute of Technology — Previous studies by the authors of the drag coefficient for thin flexible cylinders (diameter  $\sim O(\text{mm})$ ) in a cross flow for Reynolds's numbers range between 100-1000 showed about 20 – 30 percent reduction compared to literature values. At free stream low Reynolds number around 100 the spectral analysis of the hotwire signals in the wake showed tonal and broadband frequencies suggesting features similar to transition flows. To better understand the flow behind the cylinder and wake structure interaction with boundary layer for above range of Reynolds number DNS simulations were conducted. The computational study is performed for two cases: (1) flow on rigid thin cylinder, and (2) flow with 3-D fluid structure interaction for the thin cylinder. It is observed the coefficient of drag values computed for the rigid wire were 8 -12 percent lower compared to the experimental results, while simulation with the fluid structure interaction gave results within 4 percent of the experimental values. The wake structure results based on the experiment and computational study will be discussed.

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