Abstract Submitted
for the DFD20 Meeting of
The American Physical Society

Effect of Curvature on Whisker-Wake Interactions[1] CAROLINE CARDINALE, KAI KINDRED, JESSICA SHANG, University of Rochester — California sea lions effectively follow hydrodynamic trails, and have been observed to curve their whiskers forward during tracking. To test whether whisker orientation aids tracking, experiments were conducted in a recirculating water channel. A larger cylinder (1/2" OD, Re=1920) created a wake of known shedding frequency and a smooth smaller cylinder (1/8" OD, Re= 480) was placed downstream, in the larger cylinder's wake. The smaller cylinder was tested in both straight and curved (90 degree) configurations. Stereoscopic particle image velocimetry (PIV) was used to capture the flow field downstream of the smaller cylinder. Discrete Fourier analysis showed that the spectrum of the curved cylinder was dominated by a single peak, corresponding to the large cylinder's shedding frequency, while the straight cylinder showed two dominant frequencies, the large cylinder's and its own shedding frequency. This suggests that a forward-facing, curved whisker is more effective at decomposing complicated wakes because it reduces the noise the whisker itself produces.

[1]We gratefully acknowledge the support of ONR through Grant No. N00014-18-1-2456 (Program Manager Dr. Thomas Fu).

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Date submitted: 31 Jul 2020 Electronic form version 1.4