

Abstract Submitted
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Wake dynamics behind a harbor seal vibrissa: a comparative view by PIV measurements YINGZHENG LIU, SHAOFEI WANG, HANPING CHEN, Shanghai Jiao Tong University — A comprehensive study was performed of wake dynamics behind a scaled-up model of harbor seal vibrissa, and the baseline configurations of circular cylinder, wavy cylinder and the elliptical cylinder were provided for comparison. A low-speed water channel and wind tunnel were employed for the model tests at the Reynolds number $10^2 \sim 10^4$ based on diameter of the cylinder. A load cell and Particle Image Velocimetry were synchronized to measure the fluctuating lift/drag forces and the instantaneous flow field, respectively. By means of the comparative study, the unique three-dimensional wake characteristics in response to contour variations of the harbor seal vibrissa was elucidated through the Proper Orthogonal Decomposition (POD) and Dynamic Mode Decomposition (DMD) analyses of the measured flow field, demonstrating the ability of the vibrissa to suppress the vortex-induced vibration.

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