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Wakes and flow-induced oscillations of tandem cylinders in a flowing soap film[1] WENCHAO YANG, JOSAM WATERMAN, MARK STREMLER, Virginia Tech — We investigate the wake dynamics and flow-induced oscillations of a tandem two-cylinder system aligned vertically in a flowing soap film. The cylinders interact with the soap film as circular disks. The upstream cylinder is fixed in place, while the downstream cylinder is free to oscillate as a pendulum that is driven by interactions with the wake of the upstream cylinder. The soap film is a convenient system for investigating quasi-2D dynamics and considering how they compare with the typical 3D system. Wake structures are visualized by the film's interference fringes; both these and the cylinder locations are recorded with a high-speed camera system. The force response of the downstream cylinder is measured with a micro-cantilever laser-mirror sensor system. Varying the distance between the cylinders reveals multiple modes of behavior, including variations in the force response and the regularity of the oscillations.

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