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The dynamics of a flexible loop in a high-speed flow SUNGH-
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York Univ., JUN ZHANG, AML, Courant Inst., New York Univ. — We study the
behavior of an elastic loop in a fast-flowing soap film. The loop is wetted into the
film and is held fixed at a single point against the oncoming flow. We interpret this
system as a 2D closed flexible body moving in a quasi-2D flow. The loop is deformed
by the flow, and this coupled fluid-structure system shows bi-stability: stationary
and oscillatory. In its stationary state, the loop essentially remains motionless and
its wake is a von Kármán vortex street. In its oscillatory state, the loop sheds two
vortex dipoles within each oscillation period. The frequency of oscillation of the
loop is linearly proportional to the flow velocity.

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