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Characterization of vortical gusts produced by a heaving plate[1]
ESTEBAN HUFSTEDLER, BEVERLEY J. MCKEON, California Institute of Technology — To experimentally investigate the interaction between a wing and a spanwise vortical gust, a simple gust generator has been built and tested. This consists of a transversely heaving flat plate that changes direction to release a vortex, which then convects downstream to interact with a wing. Previous experiments have shown that, immediately downstream of the plate, the circulation of the generated vortex is proportional to the heaving speed of the plate. The forces that the gusts exert on a downstream wing were shown to be strongly repeatable and consistent with a passing vortex. This presentation will discuss the properties of the vortical gusts as they move downstream, and relate those properties to the important dimensionless parameters of the flow. These properties include the convection speed and circulation of the vortex, as well as the enstrophy due to the wake of the plate.

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