

Abstract Submitted
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Coupled Modification of Body-Wake Flow on an Axisymmetric Moving Platform¹ THOMAS LAMBERT, BOJAN VUKASINOVIC, ARI GLEZER, Georgia Institute of Technology — The unsteady interactions between fluidic actuators and the cross flow over the aft end of a moving bluff body are exploited for modification of the global unsteady aerodynamic loads in wind tunnel experiments using a moving axisymmetric model. The present study focuses on the effects of actuation by an azimuthally-segmented array of four aft-facing synthetic jet modules around the tail end of the model on the coupling between the moving body and its near wake. The model is supported by eight servo-controlled wires, each including a miniature inline force transducer for measurements of the time-resolved tension during the time-dependent six degrees of freedom motion along a prescribed trajectory. In the present investigations the model's motion is described by parameterized Lissajous rotation (combined pitch and yaw), which is designed to mimic the natural unstable motion of a similar airborne platform in the absence of roll. Enhancement and suppression of stabilizing aerodynamic loads on the model are each investigated using coupled force and moment measurements and particle image velocimetry in the near wake at reduced frequencies of up to 0.259.

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Thomas Lambert
Georgia Institute of Technology

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