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Active Flow Control of the Near Wake of an Axisymmetric Body in Prescribed Motion THOMAS LAMBERT, BOJAN VUKASINOVIC, ARI GLEZER, Georgia Institute of Technology — Controlled interactions between fluidic actuators and the cross flow over the aft end of a wire-mounted axisymmetric moving wind tunnel bluff body model are exploited for modification of its near wake and thereby its global unsteady aerodynamic loads. The model is supported by eight servo-controlled wires, each including a miniature inline force transducer for measurements of the time-resolved tension. The body moves along a prescribed trajectory controllable in six degrees of freedom using closed loop feedback from an external camera system. Actuation is effected by an integrated azimuthally-segmented array of four aft-facing synthetic jet modules around the perimeter of the tail end. In the present investigations, the aerodynamic loads are controlled during time-periodic axial and rotational motions with varying reduced frequencies of up to 0.259. It is shown that this flow control approach modifies the near wake and induces aerodynamic loads that are comparable to the baseline model dynamic loads. Control of the model's unsteady aerodynamic characteristics may be adopted for in flight stabilization.

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