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Rotorcraft Fuselage Flow Control Using Plasma Streamwise Vortex Generators[1] DUSTIN COLEMAN, FLINT THOMAS, University of Notre Dame — Active flow control, in the form of dielectric barrier discharge (DBD) plasma actuators, is applied to a NASA ROBIN-mod7 generic rotorcraft fuselage model. The model is considered in what would be a typical cruise position *i.e.* a nose down position at $\alpha = -5°$. This configuration gives rise to a massive 3-D flow separation over the aft ramp section of the fuselage, characterized by two counter-rotating, streamwise vortices. The control objective is to minimize these concentrated vortices by means of flush fuselage-mounted plasma streamwise vortex generators (PSVGs), and consequently, reduce the form drag of the vehicle. Experiments were conducted at freestream Mach and Reynolds numbers of $M_\infty = 0.12$ and $\mathrm{Re}_L = 2.65$ million, respectively. Aerodynamic loads under both natural and controlled conditions were acquired through use of an ATI Mini40 6-component force sensor. The pressure field on the ramp section was monitored by a 128 count static pressure array. Likewise, the flow field was captured by time-resolved PIV wake surveys. Results are compared with previous studies that utilized active flow control by way of pulsed jets or combustion actuators.

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