

Abstract Submitted
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The Effect of Closed Loop Flow Control on the Integral Scales over a 3D Turret RYAN WALLACE, MARLYN ANDINO, Syracuse University, CHRIS CAMPHOUSE, Sandia National Laboratories, RYAN SCHMIT, JAMES MYATT, Air Force Research Laboratory, MARK GLAUSER, Syracuse University — An extended active flow control study was conducted with a 3D turret with a flat aperture in the Subsonic Aerodynamic Research Laboratory (SARL) windtunnel at Wright-Patterson Air Force Base. The pressure based integral scales of the flow over the aperture are altered by using a simple, pressure based proportional closed loop controller. Control authority was obtained with actuators mounted fore of the aperture while pressure transducers mounted on and aft of the aperture provided observability of the system. For closed loop controller, the bandpass filtered temporal POD mode coefficients of the surface pressure were used as the feedback signal. Multiple control cases were examined using various POD methods such as the baseline, lumped, and split POD. Comparing the flow case with no actuation with the flow cases with the various closed loop control, a clear reduction of the integral scales is seen in each case.

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