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Effect of Zero Net-mass Flux Actuators on an Axisymmetric Jet. CARLOS PEREZ, THOMAS BOINEAU, JEREMY PINIER, MARK GLAUSER, Syracuse University — In this investigation, piezoelectric driven zero net-mass flux jets, also known as synthetic jets, are used as actuators on an axisymmetric jet with the goal of reducing the latter's far-field noise. A total of six actuators placed on the circumference of the axisymmetric subsonic jet are controlled independently so that each can produce a determined flow output with the ultimate goal of incorporating them in a closed-loop control scheme. The far-field sound, both with and without actuation, is recorded by an array of 6 microphones located at 90, 75, 60, 45, 30 and 15 degrees with respect to the jet centerline axis and positioned at 75 jet diameters from the nozzle exit. In order to better understand the effect of the actuation, stereoscopic PIV is performed perpendicularly to the jet flow at multiple downstream positions. The progress in the effort of understanding the effect of the synthetic jet actuators on the high-speed jet and its far-field sound is discussed.

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