

Abstract Submitted
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Flowfield and Acoustic radiation from imperfectly expanded supersonic jets; Experimental Investigation DAVID MUNDAY, EPHRAIM GUTMARK, University of Cincinnati — This project involves the study of sound generated by supersonic jets like those emanating from the exhausts of high-performance military aircraft. Four different nozzles are employed: one convergent nozzle and three convergent-divergent nozzles with design mach numbers of 1.3, 1.5 and 1.65. All four nozzles have the same throat area. They are all tested in a perfectly expanded condition and in an under-expanded condition. The convergent-divergent nozzles are also tested in an over-expanded condition. Flowfield and Acoustic data is presented for all cases. Far-field acoustic measurements are taken in an anechoic chamber with microphones arranged in an arc at a distance of 56 throat diameters and at a range of inlet angles representing forward, sideline and aft-angles in order to capture both mixing noise and shock-associated noise. This is a joint experimental/numerical project with the Naval Research Lab. Comparison to the numerical predictions is covered in an accompanying presentation.

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