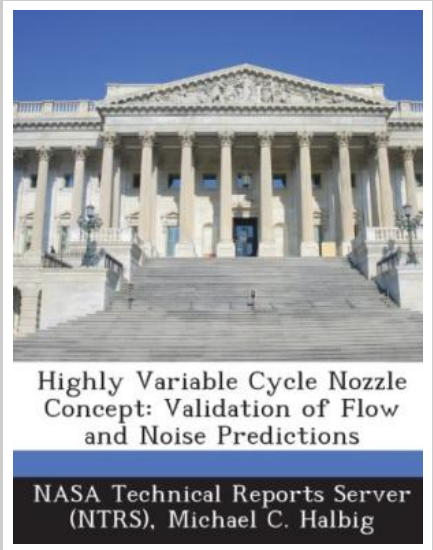



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# Highly Variable Cycle Nozzle Concept: Validation of Flow and Noise Predictions

By Michael C. Halbig

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 28 pages. Dimensions: 9.7in. x 7.4in. x 0.1in.Results from experimental and numerical studies of highly Variable Cycle (HVC) exhaust model were presented. The model was designed and fabricated under a Supersonics NRA awarded to Rolls-Royce. The model had a lobed mixer for the core stream nozzle, and elliptic fan stream nozzle, and an ejector. Experiments included far-field acoustic array, phased array, and Particle Image Velocimetry (PIV) measurements. Numerical studies included flow simulations using the WIND-US code and far-field acoustic solutions using an acoustic analogy developed by Goldstein (2003) and Leib and Goldstein (2011). Far-field acoustic measurements showed increased noise levels over the round baseline nozzle when using non-static forward flight conditions. Phased array measurements showed noise sources near the ejector doors when tones were produced for small ejector door positions. Ejector door separation identified in the experiments was reproduced in the numerical flow simulations. Acoustic solutions were unable to match levels measured in the peak jet noise direction indicating additional development work is needed to predict noise from highly three-dimensional flows. This item ships from La Vergne,TN. Paperback.

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