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CFD PREDICTION OF NARROWBAND AND BROADBAND CAVITY ACOUSTICS AT M=0.85

Two rectangular cavity configurations at Mach 0.85 are investigated with the objective of assessing the extent to which 3D CFD with advanced turbulence modeling is capable of predicting narrowband and broadband flow noise. A non-linear, two-equation, eddy-viscosity model run in unsteady mode (URANS) is compared with Detached Eddy Simulation (DES) on a cavity with a L/D ratio of 5, representing cavity flow in so-called shear layer mode. Detailed experimental data for this cavity, configured with and without doors, provides a valuable opportunity to compare predictions of the spectra at many points along the cavity ceiling and band limited amplitude along the cavity length.

Author Name:

Fred Mendonça
Richard Allen
Julien de Charentenay
David Kirkham

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AIAA

Conference Date:

Monday, May 12, 2003

Publisher:

American Institute of Aeronautics and Astronautics

ISBN:

978-1-62410-102-1

DOI:

<http://dx.doi.org/10.2514/6.2003-3303>

Conference Name:

9th AIAA/CEAS Aeroacoustics Conference and Exhibit

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