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Flow Around an Object Projected from a Cavity Into a Supersonic Freestream (Paperback)

By Scott T Bjorge

Biblioscholar, United States, 2012. Paperback. Condition: New. Language: English . Brand New Book ***** Print on Demand *****.The pressure and flow field of a supersonic flow over a cavity, with and without a store, was the focus of this experimental investigation. A single cavity geometry, with a length to depth ratio of 3.6 was studied while the freestream Mach number and the placement of the store relative to the cavity floor were varied. The traits of the pressure spectra on the cavity floor were markedly different between freestream Mach numbers of 1.8 and 2.9. While the Mach 1.8 case exhibited clear spectral peaks consistent with predictions by Rossiter, the Mach 2.9 flow field did not. With the store placed within the free shear layer, the level of pressure fluctuations measured on the cavity floor decreased for the Mach 1.8 case and increased for the Mach 2.9 case. High-speed Schlieren photography was used to visualize the interaction of the free shear layer and the modeled store. Images revealed that flow structures in the free shear layer of the Mach 2.9 flow exhibited less spanwise coherence than their Mach 1.8 flow counterparts. Images also revealed vertical displacement of the free shear layer...



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