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Effects of Segmented Slot Blowing at the Leading Edge of a Finite Span Cavity in Supersonic Flow BENJAMIN GEORGE, LAWRENCE UKEILEY, Univ of Florida - Gainesville, LOUIS CATTAFESTA, KUNIHIKO TAIRA, Florida State University — The effects of finite span on the control of surface pressures within an open cavity in Mach 1.4 flow are studied. Experiments involve a finite span, rectangular cavity with a length to depth ratio of 6 and width to depth ratio of 2 being characterized using unsteady pressure along the floor and Particle Image Velocimetry (PIV). This data is first compared to measurements taken with a full span cavity of the same length to depth ratio to elucidate the flow phenomena caused by the introduction of sidewalls. Thereafter various leading edge slot configurations are employed and their effects compared to previous experiments involving the finite span cavity to gauge the influence of blowing on the three-dimensional flow field. The effectiveness of the slot blowing to suppress the pressure fluctuations are evaluated by examining reductions in both the tonal and broadband levels of the fluctuating surface pressure spectra. PIV data inside the finite span cavity show changes in the mean properties of the flow field when comparing the baseline to the slot blowing cases. Specifically the interaction of blowing with the flow near the cavity sidewalls, the shear layer, and the recirculation region are of interest.

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