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High Speed Shadowgraph Images around a Mach 1.5 Cavity Flow Field RYAN SCHMIT, FRANK SEMMELMAYER, MITCHELL HAVERKAMP, JAMES GROVE, Air Force Research Laboratory — An examination of a rectangular cavity with an L/D of 5.67 was tested at Mach 0.7 and 1.5 with corresponding Reynolds numbers of 2x106/ft and 2.3x106/ft, respectively. High speed shadowgraph movies were simultaneously sampled with the dynamic pressure sensors at 75 kHz. Fourier analysis was performed on the high speed movies as well as the dynamic pressure data which resulted in determining the locations of dominant cavity frequencies in the flow field. From the high speed shadowgraph movies, observations of the in the cavity flow physics are discussed. Several cavity related issues are examined e.g. How do vortices form in the shear layer? What is the actual starting mechanism for these cavity acoustic tones? How do the cavity acoustic tones affect the shear layer?

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