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Wall-Pressure Correlations to Velocity Field Events for Subsonic Cavity Flows NATHAN MURRAY, LAWRENCE UKEILEY, University of Mississippi — Subsonic flow over an open cavity with a length to depth ratio of 6 is studied experimentally using a syncronous pressure-PIV setup that creates a database of PIV velocity snapshots and their corresponding surface pressure fluctuations. The two measurements are syncronized by recording the image acquisition trigger signal (TTL pulse at approximately 10Hz rate) simultaneously with the wall-pressure signals at a 90kHz sample rate. Then, the pressure values corresponding to a given PIV snapshot are extracted from the data by referencing the image acquisition trigger during post-processing. Data were collected for five free stream Mach numbers: 0.2, 0.3, 0.4, 0.6 and 0.75. Using the resulting database, the effect on the surface pressure from various acoustic analogy-type source terms is evaluated.

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