

Abstract Submitted
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Acoustic Radiation from Smart Foam for Various Foam Geometries NISHKALA SHIVAKUMAR, NC School of Science and Mathematics and NC A&T State University — Smart foam is an emerging active-passive noise control technology with many applications. Smart foam consists of passive foam with an embedded curved piezoelectric (PZT) film. We experimented with three geometries of varying film curvatures and a constant cross-sectional area of 58 cm^2 , constructed using melamine foam covered with $28 \mu\text{m}$ thick polyvinylidene fluoride (piezoelectric) films with Cu-Ni surface electrodes. An AC voltage provided by a signal generator and amplifier drives the smart foam. An omnidirectional microphone mounted at a distance 100mm from the foam surface measured the sound level (dB) and harmonic distortion generated by the smart foam. Experiments were repeated for voltages, 40V-140V, and frequencies, 300Hz-2000Hz. The result show that the sound level generated by the smart foams has a characteristic frequency response common to all geometries and a peak sound level between 900 to 1,100 Hz.

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