

Abstract Submitted  
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**The Dynamic Response of Piezoelectric Probes to Low Density Foam Impact** ALAN MEARS, FRANCES BAILY, AWE, Aldermaston, UK, REBECCA STROHMER, Cavendish Laboratory, Cambridge, UK — Small lead zirconate titanate discs within commercial piezoelectric probes were impacted by low density foams in a set of gas gun experiments. For each probe the voltage across a 50 ohm load was measured to determine the change in electrical charge on the piezoelectric disc. Three different types of foam having densities between 0.1 and 0.35 g/cc were driven at velocities up to 1.0 km/s. Impact with the piezoelectric probes was calculated to generate stresses in the range 0.07 to 0.4 GPa. Hydrocode simulations were run to predict the stress history within the piezoelectric and to interpret the shape of the measured voltage pulse. From the experimental results the piezoelectric charge coefficient  $d_{33}$  was deduced to be around three times the low stress value available for the piezoelectric material. Results for an impact stress of 0.1 GPa followed by pressure release indicate that the dynamic change in polarization has a high degree of reversibility.

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