

Abstract Submitted
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Electrical Properties of PZT 52/48 under Ramp Wave Compression¹ D.P. JACKSON, S.T. MONTGOMERY, J.L. WISE, G.E. CLARK, E.B. DUCKETT, Sandia National Laboratories — Measurements of electrical responses from ferroelectric ceramic disks under shock wave compression where the directions of wave propagation and remanent polarization are aligned have been conducted on a variety of lead zirconate titanate compositions. Analysis of the electrical responses is complicated by the electric conditions in the disk, tilt in the planar shock, and the variety of material compositions examined. A review of previous measurements on PZT 65/35 ceramic, at stress levels not expected to drive the material into the paraelectric phase and where charge is restricted from flowing from the disk, indicates that above a certain stress threshold the available charge release is complete and the inverse permittivity in the shock compressed ceramic increases linearly with compressive stress. An electrical response model, based on the these observations, is used to explain the electric output from experiments on PZT 52/48 disks under ramp wave compression when the disk faces are connected through a small, or very large, resistive load.

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