

Abstract Submitted
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Soft X-ray – Induced Shock Loading of Meteorite and Planetary Materials JOHN REMO¹, Depts. of Astronomy and E&SS, Harvard University, MICHAEL FURNISH, Sandia National Laboratories — The response of meteorite and planetary materials to high- intensity <1 keV x-rays from Z-pinch sources is described. These materials include iron and stony meteorites, magnesium rich olivine (dunite), and Al and Fe calibration samples. Input stresses varied from 6.1 to 12.4 GPa, attenuating to ~ 1.4 to 2.5 GPa for the iron meteorites, ~ 0.3 to 1.9 GPa for the stony meteorites, and 1.64 to 1.91 GPa for dunite. The calibration (pure) metals showed less attenuation than the highly inhomogeneous natural materials: 9.5 to ~ 5 GPa for Fe and 12.4 to 10.6 GP for Al. Putative equations of state are computed from Hugoniot pressure and shock velocity as a function of particle velocity. These data are useful for planetary and astrophysical modeling and for near-Earth object mitigation studies requiring momentum coupling, and momentum enhancement coefficients. Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under Contract DE-AC04-94AL85000.

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