Abstract Submitted
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Properties of dense xenon plasma under double–shock compression to 180 GPa[1] JUN ZHENG — Warm dense plasmas having uniform, constant density, and temperature were generated by passage of planar shock wave through gas. The pressure of the Xe plasma was accurately measured by optical radiation method under double–shock compression to 180 GPa. The shock was produced using the flyer plate impact by accelerated up to ∼6 km/s with a two–stage light gas gun. The time-resolved optical radiation histories were acquired by using a multi–wavelength channel optical transience radiance pyrometer. Shock velocity was measured and particle velocity was determined by the impedance–matching methods. The equation of state of dense xenon plasma are calculated using the self–consistent fluid variational theory along the Hugoniot curve and compared with present experimental results over a wide range of pressures and temperatures. The observed shock compression ratios range from Ru/Ru0=3.7 for Ru0=2.2 g/cm^3 to Ru/Ru0=8.5 for Ru0=0.04 g/cm^3. The comparison of the Hugoniots in the Pressure-compression plane clearly shows how higher initial densities result in lower final compression.

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