

Abstract Submitted
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The Refractive Index and Transparency of Lithium Fluoride Compressed to 800 GPa¹ DAYNE ERIC FRATANDUONO, T.R. BOEHLY, J.H. EGGERT, M.A. BARRIOS, R. SMITH, P.M. CELLIERS, D.G. HICKS, G.W. COLLINS, D.D. MEYERHOFER — Lithium fluoride, ramp compressed by direct laser ablation, is observed to remain transparent up to 800 GPa. Simultaneous measurements of the free-surface and interface (particle) velocities in a two-section diamond-LiF target determine the velocity-correction factor and the refractive index of compressed LiF. The refractive index is observed to increase linearly with density over pressures of 30 to 800 GPa. An effective single-oscillator model shows that the refractive index is linear in density as a result of the optical gap closing monotonically with increasing density. Extrapolation of these results indicate that metallization of LiF should occur at pressures significantly higher than the Goldhammer–Herzfeld criterion (~ 2750 GPa), suggesting that LiF will remain transparent at extremely high pressures.

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