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The Refractive Index and Transparency of Lithium Fluoride Compressed to 800 GPa D.E. FRATANDUONO, M.A. BARRIOS, T.R. BOEHLY, D.D. MEYERHOFER, Laboratory for Laser Energetics, U. of Rochester, J.H. EGGERT, R. SMITH, D.G. HICKS, P.M. CELLIERS, G.W. COLLINS, LLNL — 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 ($\sim$2750 GPa), suggesting that LiF will remain transparent at extremely high pressures. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-08NA28302.

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