Abstract Submitted
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Ionization balance measurements in low-Z materials by x-ray scattering[1] GIANLUCA GREGORI, LLNL, S.H. GLENZER, LLNL, E. DEWALD, LLNL, D. HICKS, LLNL, O.L. LANDEN, LLNL, T.M. BORDERS, LBL, H. SAWADA, UR/LLE, S.P. REGAN, UR/LLE — We have measured the ionization balance of carbon/beryllium plasmas by covering both the weakly ionized and the nearly fully ionized regimes. The plasma was created by either irradiation with x-rays or direct heating with laser beams at the Omega laser facility. Using as a probe the 4.75 keV (9.0 keV) He-α line radiation produced by simultaneously irradiating a Ti (Zn) foil, we have recorded time-resolved spectrally dispersed scattered spectra with a high efficiency graphite Bragg crystal coupled to a framing camera. Measured values for the plasma temperature and ionization state were obtained by fitting Doppler-broadened and Compton red-shifted scattered spectra at various times after the end of the laser heating. The underlying correlations induced by a solid-state lattice at low temperature are also included in the analysis by comparison with experimental scattering spectra obtained at the Advanced Light Source on cold samples. Comparisons with radiation-hydrodynamics codes are presented.

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