Abstract Submitted
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Generation of Hot Dense Matter in High Intensity Laser Plasma Interaction Experiments[1] S.N. CHEN, University of California, San Diego, G. GREGORI, Rutherford Appleton Laboratory, Chilton, Oxfordshire, UK, S.B. HANSEN, J.A. KING, S. WILKS, A.J. MACKINNON, Lawrence Livermore National Lab, R.B. STEPHENS, General Atomics, R.R. FREEMAN, R.L. WEBER, The Ohio State University, F. KHATTAK, D. RILEY, E. GARCIA SAIZ, Queens University of Belfast, N. Ireland, UK, R. EVANS, M. NOTLEY, Rutherford Appleton Laboratory, Chilton, Oxfordshire, UK, F.N. BEG, University of California, San Diego — We have studied the heating to T_e >100 eV of tamped Ti foil targets at near solid density, conditions which are found in inertial confinement fusion and laboratory astrophysics plasmas. The experiments were conducted at the Vulcan Laser Facility at the Rutherford Appleton Laboratory (UK) using a 100 J, 1.5 ps laser beam focused to a 10 micron spot onto Al or CH coated Ti flat foils. The Ti inner-shell spectra (4–5 keV) have been measured both from the front (i.e., the laser side) and back of the target. The data from the back show a large shift in the K-alpha emission compared to cold metal, suggesting a high degree of heating. Simulations using collisional radiative and 1-D radiation hydrodynamics codes were used to study opacity effects on the emitted spectra. This allows us to infer the average electron temperature and ionization state.

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