Abstract Submitted
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Spectral and Atomic Physics Analysis of Xenon L-Shell Emission From High Energy Laser Produced Plasmas[1] DANIEL THORN, G. E. KEMP, K. WIDMANN, R. D. BENJAMIN, M. J. MAY, J. D. COLVIN, M. A. BARRIOS, K. B. FOURNIER, D. LIEDAHL, A. S. MOORE, B. E. BLUE, Lawrence Livermore National Labratory, Livermore CA 94550 — The spectrum of the L-shell (n=2) radiation in mid to high-Z ions is useful for probing plasma conditions in the multi-keV temperature range. Xenon in particular with its L-shell radiation centered around 4.5 keV is copiously produced from plasmas with electron temperatures in the 5-10 keV range. We report on a series of time-resolved L-shell Xe spectra measured with the NIF X-ray Spectrometer (NXS) in high-energy long-pulse (>10 ns) laser produced plasmas at the National Ignition Facility. The resolving power of the NXS is sufficiently high (E/∂E >100) in the 4-5 keV spectral band that the emission from different charge states is observed. An analysis of the time resolved L-shell spectrum of Xe is presented along with spectral modeling by detailed radiation transport and atomic physics from the SCRAM code and comparison with predictions from HYDRA a radiation-hydrodynamics code with inline atomic-physics from CRETIN.

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