Abstract Submitted
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X-ray Spectroscopy of ICF Shock-Ignition Implosions at OMEGA[1] R. FLORIDO[2], R.C. MANCINI, T. NAGAYAMA, Department of Physics, University of Nevada, Reno, R. TOMMASINI, Lawrence Livermore National Laboratory, J.A. DELETTREZ, S.P. REGAN, B. YAAKOBI, Laboratory for Laser Energetics, University of Rochester — OMEGA direct-drive shock-ignition implosions of thick-wall CH spherical shell targets filled with deuterium and a tracer amount of argon were performed. The argon line spectrum is primarily emitted at the collapse of the implosion thus providing a spectroscopic signature of the state of the implosion core. The spectra analysis also yields information about the state of the compressed shell since the argon emission from the core is significantly attenuated by the compressed shell confining the core. The observed spectra include line transitions in H-, He- and Li-like argon ions thus covering a broad photon energy range from 3.0 keV to 4.3 keV. A detailed atomic physics and radiation transport model has been developed to interpret and analyze the recorded data. The method was first tested with synthetic spectra computed by post-processing LILAC 1D hydrodynamic simulations, and then applied to the diagnosis of OMEGA shock-ignition implosions.

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[2]Permanent address: Departamento de Física, Universidad de Las Palmas de Gran Canaria

R. Florido
Department of Physics, University of Nevada, Reno

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