

Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Multiview observation and analysis of OMEGA direct-drive implosion cores¹ T. NAGAYAMA, R.C. MANCINI, University of Nevada, Reno, L.A. WELSER-SHERRILL, Los Alamos National Laboratory, R. TOMMASINI, J.A. KOCH, Lawrence Livermore National Laboratory, J. DELETTREZ, S. REGAN, V. SMALYUK, Laboratory for Laser Energetics, I. GOLOVKIN, Prism Computational Sciences — We discuss the observation and data analysis of OMEGA direct-drive implosion cores based on data recorded with three identical multi-monochromatic x-ray imagers. These instruments observed the implosion core along three quasi-orthogonal lines-of-sight, and recorded gated images of the core. The targets were plastic shells filled with deuterium gas and a tracer amount of argon for diagnostic purposes. Core imaging was based on argon Ly α , He β and Ly β line emission. The data analysis rely on detailed spectral models that take into account non-equilibrium atomic kinetics, Stark broadened line shapes, and radiation transport calculations and a search and reconstruction technique based on a novel application of Pareto genetic algorithms to plasma spectroscopy. The spectroscopic analysis yields the spatial profiles of temperature and density in the core at the collapse of the implosion.

¹This work is supported by DOE/NLUF Grant DE-FG52-07NA28062, LLNL.

Taisuke Nagayama
University of Nevada, Reno

Date submitted: 25 Jul 2007

Electronic form version 1.4