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Radiative Transport Modeling Relevant to Cryogenic Implosion Simulation and Diagnosis R. EPSTEIN, J.A. DELETTREZ, V.N. GONCHAROV, J.P. KNAUER, P.W. MCKENTY, F.J. MARSHALL, P.B. RADHA, S.P. REGAN, H. SAWADA, B. YAAKOBI, Laboratory for Laser Energetics, U. of Rochester — The design of OMEGA cryogenic implosion experiments relies in part on modeling radiative preheat, one method of improving the hydrodynamic stability of the imploding shell. Diagnosing the core temperature and shell density near peak compression relies in part on modeling shell-absorption spectroscopy. Important elements of our modeling, including atomic physics approximations, high-density physics, transport methods, and multidimensional hydrodynamic effects are identified, and their impact on the accuracy of the radiative transport simulation and on the interpretation of the measured spectra are considered. Simulation results are compared with observed spectra from both the ablative preheat and the core emission phases of the implosions. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-92SF19460.

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