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Modeling NLTE effects in thin-shell direct-drive Omega capsule implosions[1] A.R. MILES, J.A. KOCH, W. HSING, H.-S. PARK, H.F. ROBEY, H.A. SCOTT, Lawrence Livermore National Laboratory , J.A. FRENJE, C.K. LI, R.D. PETRASSO, F.H. SEGUIN, MIT, V.YU. GLEBOV, C. STOECKL, Laboratory for Laser Energetics, U. of Rochester — An experimental effort is currently underway in which thin (4 μm) glass-shell DHe3-filled capsules are fielded in direct-drive implosions at the OMEGA Laser Facility. The thin shells result in fast implosions and shock-heating of the gas to ion temperatures up to about 10 keV, while the electron and radiation temperatures remain significantly lower and separate from one another. One goal of these experiments is to obtain independent time-resolved measurements of these three temperatures in order to study matter-radiation coupling in a system that is nonequilibrium and can be made to be NLTE by adding high-Z dopants such as Xe. The addition of Xe has a strong imact on the implosion dynamics and TN yields, and makes the targets much more difficult to model via numerical simulations. In this paper, we compare simulation results obtained with different NLTE models and discuss requirements for reasonable agreement with the data.

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