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Numerical simulations of thin-shell direct-drive Omega capsule implosions[1] AARON MILES, WARREN HSING, JEFF KOCH, HYE-SOOK PARK, HARRY ROBEY, Lawrence Livermore National Laboratory, JOHAN FRENJE, CHIKANG LI, RICHARD PETRASSO, JAMES RYGG, FREDRICK SEQUIN, Massachusetts Institute of Technology, VLADIMIR GLEBOV, CHRISTIAN STOECKL, Laboratory for Laser Energetics — An experimental effort is currently underway in which thin (4 μm) glass-shell 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 temperatures up to and in excess of 10 keV. One goal of these experiments is to obtain independent time-dependent measurements of ion, electron, and radiation 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. In this paper, we give an overview of the experimental setup and a summary of the results to date. We then discuss in some detail the simulations: how they are run, how well they compare with the data, and what they suggest about the physics of matter- radiation coupling and mix-induced yield degradation in ICF capsules.

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