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Three-Dimensional Simulations of the Deceleration Phase of Inertial Fusion Implosions K.M. WOO, R. BETTI, A. BOSE, R. EPSTEIN, J.A. DELETTREZ, K.S. ANDERSON, R. YAN, P.-Y. CHANG, D. JONATHAN, M. CHARISSIS, Fusion Science Center and Laboratory for Laser Energetics, U. of Rochester — The three-dimensional radiation–hydrodynamics code *DEC3D* has been developed to model the deceleration phase of direct-drive inertial confinement fusion implosions. The code uses the approximate Riemann solver on a moving mesh to achieve high resolution near discontinuities. The domain decomposition parallelization strategy is implemented to maintain high computation efficiency for the 3-D calculation through message passing interface. The implicit thermal diffusion is solved by the parallel successive-over-relaxation iteration. Results from 3-D simulations of low-mode Rayleigh–Taylor instability are presented and compared with 2-D results. A systematic comparison of yields, pressures, temperatures, and areal densities between 2-D and 3-D is carried out to determine the additional degradation in target performance caused by the three-dimensionality of the nonuniformities. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944 and DE-FC02-04ER54789 (Fusion Science Center).

K.M. Woo
Fusion Science Center and Laboratory for Laser Energetics, U. of Rochester

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