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Theoretical Investigation of Strong Coupling and Degeneracy Effects in ICF Implosions S.X. HU, V.N. GONCHAROV, T.R. BOEHLY, P.B. RADHA, S. SKUPSKY, Laboratory for Laser Energetics, U. of Rochester, B. MILITZE, U. of California–Berkley — Accurate knowledge of the equation of state (EOS) and opacity is essential to inertial confinement fusion (ICF). Low-adiabat ICF implosion designs reach strongly coupled, degenerate plasma conditions. Using the first-principles, path-integral Monte Carlo method, we have established an EOS table of deuterium, spanning typical ICF shell conditions (densities of 0.001 to 100 g/cc and temperatures of 1 eV to 1 keV). Noticeable differences in energy/pressure at moderately coupled, degenerate regimes have been found in comparison to the *SESAME* and Thomas-Fermi EOS. Hydrodynamic simulations using these EOS's and opacities for OMEGA implosions will be presented. This work was supported by U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-08NA28302.

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