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Enhanced NLTE Atomic Kinetics Modeling Capabilities in HYDRA[1] MEHUL V. PATEL, HOWARD A. SCOTT, MICHAEL M. MARINAK, Lawrence Livermore National Laboratory — In radiation hydrodynamics modeling of ICF targets, an NLTE treatment of atomic kinetics is necessary for modeling high-Z hohlraum wall materials, high-Z dopants mixed in the central gas hotspot, and is potentially needed for accurate modeling of outer layers of the capsule ablator. Over the past several years, the NLTE DCA atomic physics capabilities in the 3D ICF radiation hydrodynamics code HYDRA have been significantly enhanced. The underlying atomic models have been improved, additional kinetics options including the ability to run DCA in cells with dynamic mixing of species has been added, and the computational costs have been significantly reduced using OpenMP threading. To illustrate the improved capabilities, we will show higher fidelity results from simulations of ICF hohlraum energetics, laser irradiated sphere experiments, and ICF capsule implosions.

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