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Imprint Simulations of 1.5-MJ NIF Implosions Using a Refractive 3-D Laser Ray Trace with an Analytic SSD Model J.A. MAROZAS, P.W. MCKENTY, P.B. RADHA, S. SKUPSKY, Laboratory for Laser Energetics, U. of Rochester — Direct-drive implosions for the 1.5-MJ National Ignition Facility are simulated to study the effects of perturbation growth using a refractive 3-D ray trace in the multidimensional hydrodynamics code *DRACO*. An analytic formulation of 2-D SSD has been coupled with the refractive 3-D ray trace to provide a continuous temporal description of the modal amplitudes incident on target. This analytic SSD model, together with an inverse projection method of ray-initialization and adaptive integrators, minimize laser deposition noise reducing it to levels well below imprint efficiencies. Previous simulations have ignored effects of refractive smoothing because of approximations in the laser deposition models and issues with noise. These simulations will provide the first look at the effect of imprint on an imploding target with 2-D SSD smoothing using a refractive 3-D ray trace. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-92SF19460.

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