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Optimizing Direct-Drive Performance for Thin-Shell ICF Implosions on NIF[1] I.L. TREGILLIS, M.J. SCHMITT, G.R. MAGELSSEN, S.M. FINNEGAN, Los Alamos National Laboratory — The Applications of Ignition (AoI) project at LANL is designing direct-drive NIF experiments for analyzing the evolution of feature-driven shocks in the presence of TN burn. Because the NIF beam geometry is optimized for hohlraum targets, care must be taken to achieve the most symmetric drive possible, to ensure that irregularities imposed by the drive do not overwhelm the intended experimental features. NIF Polar Direct Drive (PDD) configurations have been proposed in the past [Cok et al., Phys. Plasmas, 15, 082705 (2008)], but for the purpose of maximizing neutron yield. We present results from an extension of the Cok et al. work aimed at minimizing the Legendre mode content imposed by the PDD configuration. This required multiparameter modeling of the empirical NIF phase-plate data within our Lagrangian radiation-hydrodynamic calculations. We conducted multidimensional parameter scans of our calculations to identify the optimal drive configuration for thin-shell NIF capsules.

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