

Abstract Submitted
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Design of a Polar-Drive, Alpha-Heating Platform for the National Ignition Facility T.J.B. COLLINS, J.A. MAROZAS, J.A. DELETTREZ, P.W. MCKENTY, S. SKUPSKY, Laboratory for Laser Energetics, U. of Rochester, D. CAO, J. CHENHALL, G. MOSES, U. of Wisconsin — Polar drive (PD)¹ allows one to conduct direct-drive-ignition experiments at the National Ignition Facility (NIF) while the facility is configured for x-ray drive. A PD-ignition design has previously been developed.² A new, robust PD design has been developed with the goal of achieving alpha-heating and deuterium-tritium yields in excess of 10^{16} neutrons at the NIF with the final optics and direct-drive cryogenic target positioner intended for subsequent PD-ignition experiments. This design uses a higher fuel adiabat, which precludes scaling to ignition but results in greater stability and experimental control, minimizing fuel-shell mix during the deceleration phase of the implosion. The new design also incorporates the effects of cross-beam energy transfer and nonlocal electron transport. This platform will make it possible to test radiation-hydrodynamic codes in preparation for PD-ignition experiments. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

¹S. Skupsky *et al.*, Phys. Plasmas **11**, 2763 (2004).

²T. J. B. Collins *et al.*, Phys. Plasmas **19**, 056308 (2012).

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