Abstract Submitted
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High-Gain Shock Ignition on the National Ignition Facility[1] L.J. PERKINS, K. LAFORTUNE, D. BAILEY, M. LAMBERT, A. MACKINNON, D. BLACKFIELD, A. COMLEY, Lawrence Livermore National Laboratory, G. SCHURTZ, X. RIBEYRE, E. LEBEL, A. CASNER, Celia CEA, R.S. CRAXTON, R. BETTI, P. MCKENTY, K. ANDERSON, W. THEOBALD, LLE, A. SCHMITT, NRL, S. ATZENI, A. SCHIAVI, U.Rome — Shock ignition offers the possibility for a near-term test of high-gain ICF on the NIF at less than 1MJ drive energy and with day-1 laser hardware. We will summarize the status of target performance simulations, delineate the critical issues and describe the R&D program to be performed in order to test the potential of a shock-ignited target on NIF. In shock ignition, compressed fuel is separately ignited by a late-time laser-driven shock and, because capsule implosion velocities are significantly lower than those required for conventional hotpot ignition, simulations indicate that fusion energy gains of 60 may be achievable at laser energies around 0.5MJ. Like fast ignition, shock ignition offers high gain but requires only a single laser with less demanding timing and focusing requirements. Conventional symmetry and stability constraints apply, thus a key immediate step towards attempting shock ignition on NIF is to demonstrate adequacy of low-mode uniformity and shock symmetry under polar drive

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