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Single shock implosion on the NIF SEBASTEIN LE PAPE, LAURENT DIVOL, LAURA BERZAK HOPKINS, DAN CASEY, Lawrence Livermore National Laboratory, ALEX ZYLSTRA, MIKE ROSENBERG, MARIA GATU JOHNSON, JOHAN FRENJE, MIT, RICHARD BIONTA, JIM MACNANEY, BOB KAUFFMAN, JOE KILKENNY, JOHN LINDL, WARREN HSING, JOHN EDWARDS, Lawrence Livermore National Laboratory, RICHARD PETRASSO, MIT, NATHAN MEEZAN, ANDREW MACKINNON, Lawrence Livermore National Laboratory, NIC COLLABORATION — The indirect Drive Exploding Pusher (IDEP) is a new experimental platform fielded on the National Ignition Facility to study capsule hydrodynamic performance. A vacuum hohlraum and one color laser power are used to minimize the laser-plasma interaction uncertainty due to cross beam energy transfer, while symmetry of the implosion is achieved through direct power balance between the inner and outer cones. A single shock is launched into a 120 μm thick CH capsule filled with DD or DT gas. The capsule thickness and hohlraum drive are designed so that the ablator explodes in flight and has a low convergence factor ($\sim$ 5). The neutron yield is then dominated by the shock flash/free fall yield before ablator material can mix into the fuel. On the first experiment using a DD fill, the measured laser to hohlraum coupling was 99%, and the measured neutron yield came within 15% of the yield predicted by simulations using an undegraded drive. Results and hydrodynamic simulations of this new experimental platform will be presented. This work was performed under the auspices of the U.S. Department of Energy by the Lawrence Livermore National Laboratory under contract DE-AC52-07NA27344.

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