Abstract Submitted
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Pushered Single Shell (PSS) experiments with graded High-Z – Be capsules on the National Ignition Facility[1] EDUARD DEWALD, STEPHAN MACLAREN, DAVID MARTINEZ, ROBERT TIPTON, DARWIN HO, CORIE HORWOOD, GREGORY MELLOS, ABBAS NIKROO, JESSE PINO, SHON PRISBREY, SHAHAB KHAN, ED HARTOUNI, Lawrence Livermore Natl Lab, HONGWEI XU, NEAL RICE, JOHN BAE, CASEY KONG, General Atomics, San Diego, CA — Hydrodynamic instabilities and mix are of major interest in the field of High Energy Density physics. Graded High-Z Pushered Single Shells (PSS) capsules are predicted to achieve high neutron yields via core tamping and radiation trapping that increase confinement time and reduce bremmstrahlung losses compared to conventional inertial confinement fusion implosions. Adverse effects of core cooling by fuel gas-pusher mix are mitigated using a pure thin Be anti-mix layer. Experiments were performed recently on the National Ignition Facility (NIF) using novel capsules with graded Be/Cr metal shells that reach 50% Cr concentration in the pusher and have a graded transition to pure Be ablator to mitigate hydrodynamic instabilities. Be/Cr capsules are hydrodynamic surrogates for Be/Mo capsules that are predicted to achieve fusion yields similar to ICF implosions using 6 mg/cc gas DT fuel. First Be/Cr experiments are focused on shock timing, early symmetry and implosion shape tuning. The opaque capsule implosions are characterized by neutron imaging and dedicated hard x-ray (<30 keV) radiography using NIF's Advanced Radiographic Capability (ARC). The results of these first experiments and effects on mix models will be discussed.

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