Abstract Submitted
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Near-vacuum hohlraums with uranium walls for driving high density carbon ablators[1] N.B. MEEZAN, E.L. DEWALD, L.F. BERZAK HOPKINS, A.S. MOORE, M.V. SCHNEIDER, C.A. THOMAS, R. TOMMASINI, D.D. HO, D.S. CLARK, C.R. WEBER, A.V. HAMZA, A. NIKROO, S. LE PAPE, L. DIVOL, A.J. MACKINNON[2], Lawrence Livermore National Laboratory — We present experimental results for unlined uranium near-vacuum hohlraums on the National Ignition Facility. X-ray wall losses are lower in uranium than in gold at radiation temperatures near 300 eV. In addition, the intensity of x-rays with energy $h\nu > 1.8$ keV is lower for uranium hohlraums. The softer uranium spectrum allows the use of ablators with lower levels of dopants that reduce rocket efficiency and increase the risk of polluting the hot-spot with emissive material. Experiments in the View-Factor platform[3] measured 5% higher total x-ray intensity and 30% lower intensity of $h\nu > 1.8$ keV for uranium relative to gold. Back-lit implosions using undoped high-density carbon (HDC, or diamond) capsules achieved a velocity of 400 ± 20 km/s compared to 360 ± 20 km/s for gold. These results have led the NIF HDC campaign to baseline uranium hohlraums for upcoming experiments.

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[3]S. A. MacLaren et al., Phys. Rev. Letters 112, 105003 (2014).

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