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Measurements of ablation-front hydrodynamic instability growth in high-density carbon (HDC) ignition targets at the National Ignition Facility (NIF)[1] D. CASEY, V. SMALYUK, L. PETERSON, L. BERZAK HOPKINS, T. BUNN, LLNL, L. CARLSON, GA, S. HAAN, D. HO, LLNL, D. HOOVER, GA, J. KROLL, O. LANDEN, S. LE PAPE, A. MACKINNON, A. MACPHEE, N. MEEZAN, J. MILOVICH, LLNL, A. NIKROO, GA, B. REMINGTON, H. ROBEY, S. ROSS, LLNL — High-density carbon (HDC) has emerged as a promising ablator for ignition experiments at the National Ignition Facility (NIF) partly because of its efficient coupling of the drive energy to fuel. Experiments during the National Ignition Campaign using a CH plastic ablator have shown that instability growth and the resultant mix of plastic into the hotspot was a significant source of overall the observed performance degradation. Likewise, mix of HDC ablator into the hotspot may also be a concern, as growth rates for HDC are comparable to CH and ablator/dopant is higher Z than CH ablators making the consequences potentially more severe. To help understand this issue, we plan to perform the first instability growth measurements of W-doped HDC implosions with preimposed mode 60 and mode 90 perturbations in convergent geometry using actual ignition targets and drives. These results will be presented and compared to ignition design simulations.

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