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The High-Foot Implosion Campaign on the National Ignition Facility[1]

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The 'High-Foot' platform manipulates the laser pulse-shape coming from the National Ignition Facility (NIF) laser to create an indirect drive 3-shock implosion that is significantly more robust against instability growth involving the ablator and also modestly reduces implosion convergence ratio. This tactic gives up on theoretical high-gain in an inertial confinement fusion implosion in order to obtain better control of the implosion and bring experimental performance in-line with calculated performance, yet keeps the absolute capsule performance relatively high. This approach is generally consistent with the philosophy laid out in a recent international workshop on the topic of ignition science on NIF ["Workshop on the Science of Fusion Ignition on NIF," *Lawrence Livermore National Laboratory* Report, LLNL-TR-570412 (2012). *Op cit.* V. Gocharov and O.A. Hurricane, "Panel 3 Report: Implosion Hydrodynamics," LLNL-TR-562104 (2012)]. Side benefits our the High-Foot pulse-shape modification appear to be improvements in hohlraum behavior—less wall motion achieved through higher pressure He gas fill and improved inner cone laser beam propagation. Another consequence of the 'High-Foot' is a higher fuel adiabat, so there is some relation to direct-drive experiments performed at the Laboratory for Laser Energetics (LLE) [V. Goncharov, et al. APS-DPP (2012)]. In this talk, we will cover the various experimental and theoretical motivations for the High-Foot drive as well as cover the experimental results that have come out of the High-Foot experimental campaign. Most notably, at the time of this writing record DT layer implosion performance with record low levels of inferred mix and excellent agreement with one-dimensional implosion models without the aid of mix models.

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