Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

A Review of Bigfoot Implosion Data at the National Ignition Facility CLIFF THOMAS, Laboratory for Laser Energetics — We consider the motivations for the high-velocity/high-adiabat approach to indirect drive known as "Bigfoot," and review experiments from 2015 to 2018. We show that performance is a function of symmetry, as expected, and that layered data follows near-1-D scaling(s) for hot-spot pressure[1] and capsule radius.[2] While the design was not intended to achieve high performance, it also reaches high pressure (360 Gbar), yield (2.0 10^{16}), alpha heating (3.2), and fusion gain $[1.2\times \sim (Y)/(3/2\, pV)]$, at a compression ratio similar to data at a lower-design adiabat (1.5 to 2.5).[3] We use these results to extrapolate in energy and scale,[4] and suggest experiments that could explain current performance (limits). This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DEAC52-07NA27344 and is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0003856.

[1] K. L. Baker *et al.*, Phys. Rev. Lett. **121**, 135001 (2018).
[2] D. T. Casey *et al.*, Phys. Plasmas **25**, 056308 (2018).
[3] C. A. Thomas *et al.*, "Using Indirect Drive Data to Extrapolate in Energy and Scale," to be submitted to Physical Review Letters.
[4] C. A. Thomas *et al.*, "Compression in High-Performance Indirect Drive Implosions at the National Ignition Facility," to be submitted to Physical Review Letters.

Cliff Thomas
Laboratory for Laser Energetics

Date submitted: 03 Jul 2019

Electronic form version 1.4