Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Increasing stability and maintaining performance of magneto-inertial fusion targets via self-similar scaling strategies[1] D. E. RUIZ, P. F. SCHMIT, D. A. YAGER-ELORRIAGA, Sandia National Laboratories — Magneto-inertial fusion (MIF) concepts, such as the Magnetized Liner Inertial Fusion (MagLIF) platform [M. R. Gomez et al, Phys. Rev. Lett. **113**, 155003 (2014)], constitute a promising avenue for achieving ignition and significant fusion yields in the laboratory. Under constraints imposed by capabilities of present-day pulsed-power facilities, increasing the performance and stability of MIF targets remains an important and challenging task. In this talk, we present a theoretical framework for scaling MIF-target parameters with respect to target radius and liner density while maintaining self-similar implosion trajectories. We provide analytical estimates for the scaling of energy losses and fusion performance metrics. Specifically, while holding peak current, laser preheat energy, and liner material fixed, we show that decreasing the initial target radius R_0 leads to increases in target robustness to hydrodynamical instabilities and maintains target performance by enabling thicker (smaller aspect ratio) liners and higher driver pressures, respectively. We compare our results to numerical simulations.

[1]SNL is managed and operated by NTESS under DOE NNSA contract DE-NA0003525.

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Date submitted: 01 Jul 2020 Electronic form version 1.4