place this abstract near those of my other colleagues from:
Magneto-Inertial Fusion, University of Nevada, Reno, and University of California, San Diego,
and in the special section for projects funded by the ARPA-E.

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Shock formation and Magneto-Rayleigh-Taylor instability mitigation in double-shell Staged Z-pinch implosions[1] JEFF NARKIS, F. BEG, F. CONTI, University of California, San Diego, H. U. RAHMAN, E. RUSKOV, Magneto-Inertial Fusion Technologies, Inc., M. P. ROSS, J. C. VALENZUELA, University of California, San Diego, F. J. WESSEL, Magneto-Inertial Fusion Technologies, Inc. — Target preheating in a magneto-inertial fusion scheme like the Staged Z-pinch is required to reduce the required convergence ratio for reaching fusion conditions. The current iteration of the Staged Z-pinch uses a single, high-Z gas-puff liner to compress a deuterium (D) target. Prior MHD simulations1 of similar implosions on a 1 MA driver predicted peak and average implosion velocities of 20 and 10 cm/us, respectively, which resulted in shock temperatures far below the 100 eV required for target preheating[2]. Reduction of liner mass is an effective approach to increasing implosion velocity experimental implosion velocities exceeding 30 cm/μs have been reported and therefore shock strength, however this also results in increased magneto-Rayleigh-Taylor (MRT) instability growth. Both using a double liner and an axial magnetic field are effective mitigation mechanisms for MRTI growth. However, a double liner provides better MRTI mitigation and a fortuitous increase in shock strength and implosion velocity over a single liner, as demonstrated in simulated Kr / D and Ne / Kr / D implosions.

[1]Funded by the Advanced Research Projects Agency - Energy, grant DE-AR0000569
[2]J. Narkis et al., Phys. Plasmas 23, 122706 (2016)

Frank Wessel
Magneto-Inertial Fusion Technologies, Inc.

Date submitted: 14 Jul 2017 Electronic form version 1.4