Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Fusion Reactor and Break-Even Experiment Based on Stabilized Liner Compression of Plasma[1] PETER TURCHI, SHERRY FRESE, MICHAEL FRESE, NumerEx LLC — An optimum regime [1], known as magnetized-target or magneto-inertial fusion (MTF/MIF), requires magnetic fields at megagauss levels, which are attainable by use of dynamic conductors called liners. The stabilized liner compressor (SLC) provides the basis for controlled implosion and re-capture of the liner for reversible energy exchange between liner kinetic energy and the internal energy of a magnetized-plasma target. This exchange requires rotational stabilization of Rayleigh-Taylor modes on the inner surface of the liner and pneumatically driven free-pistons that eliminate such modes at the outer surface [1, 2]. We discuss the implications of the SLC approach for the power reactor, a breakeven experiment, and intermediate experiments to develop the plasma target. Features include the importance of pneumatic drive and the liner-blanket for economic feasibility of MTF/MIF. [1] P.J. Turchi, "Imploding Liner Compression of Plasma: Concepts and Issues", IEEE Trans. on Plasma Science, 36, 1, 52 (2008). [2] P.J. Turchi, et al, "Review of the NRL Liner Implosion Program", in Megagauss Physics and Technology, P.J. Turchi, ed., Plenum, NY (1980). P. 375.

[1]Supported by ARPA-E ALPHA Program

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Date submitted: 13 Jul 2016 Electronic form version 1.4