Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Issues with Strong Compression of Plasma Target by Stabilized Imploding Liner PETER TURCHI, SHERRY FRESE, MICHAEL FRESE, NumerEx — Strong compression (10:1 in radius) of an FRC by imploding liquid metal liners, stabilized against Rayleigh-Taylor modes, using different scalings for loss based on Bohm vs 100X classical diffusion rates, predict useful compressions with implosion times half the initial energy lifetime [1]. The elongation (length-to-diameter ratio) near peak compression needed to satisfy empirical stability criterion and also retain alpha-particles is about ten. The present paper extends these considerations to issues of the initial FRC, including stability conditions (S*/E) and allowable angular speeds. Furthermore, efficient recovery of the implosion energy and alpha-particle work, in order to reduce the necessary nuclear gain for an economical power reactor, is seen as an important element of the stabilized liner implosion concept for fusion. We describe recent progress in design and construction of the high energy-density prototype of a Stabilized Liner Compressor (SLC) leading to repetitive laboratory experiments to develop the plasma target. [1] P.J. Turchi, S.D. Frese, M.H. Frese, "Stabilized Liner Compressor for Low-Cost Controlled Fusion at Megagauss Field-Levels," IEEE Trans. on Plasma Science, October 2017. *Supported by ARPA-E ALPHA Program

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Date submitted: 09 Jul 2017 Electronic form version 1.4