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Liner Compression of an FRC: Implosion vs Diffusion Times PETER TURCHI, Compact Fusion Systems, Inc. — To achieve the cost-minimum regime near a megagauss for a controlled fusion power reactor [1] requires repetitive operation of the liner implosion. Such operation is possible with piston-driven liquid metal liners, stabilized by rotation against growth of Rayleigh-Taylor modes. A common complaint, however, is that these implosions may be too slow to provide energy and temperature gain in compressing FRCs. The present paper compares times for liner compression and for loss by diffusion of flux, particles and energy. The condition on ideal contraction of FRC length with radius, $h/r^{0.4}$ = constant, used in earlier work [1] is relaxed here for a self-consistent model. Successful compression again appears possible, even for implosion time half the loss time, which may be satisfied for pneumatically-driven, compressible liners and neo-classical transport. Issues of mirror effects in the open-field region are also discussed in regard to extrapolating experimental studies to reactor conditions. [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, 45, 10, 2800 (2017).

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