Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Optimizing Field-Reversed Configuration Plasmas for Plasma Compression Experiments C. GRABOWSKI, J.H. DEGNAN, D.J. AMDAHL, M. DOMONKOS, E.L. RUDEN, W. WHITE, Air Force Research Laboratory, G.A. WURDEN, Los Alamos National Laboratory, M.H. FRESE, S.D. FRESE, J.F. CAMACHO, S.K. COFFEY, NumerEx, M. KOSTORA, J. MCCULLOUGH, W. SOMMARS, S.A.I.C., G.F. KIUTTU, VariTech Services, A.G. LYNN, Univ. of New Mexico, K. YATES, B.S. BAUER, S. FUELLING, Univ. of Nevada, Reno, R. PAHL, Missouri Univ. of Science and Technology — The Field-Reversed Configuration Heating Experiment (FRCHX) is a collaborative experiment between the Air Force Research Laboratory (AFRL) and Los Alamos National Laboratory (LANL) to study high energy density plasmas and various associated phenomena. With FRCHX, a field-reversed configuration (FRC) plasma is formed via reversed-field theta pinch and then translated a short distance into a cylindrical aluminum shell (solid liner), where it is either compressed by the magnetically-driven implosion of the shell or diagnosed in preparation for such compression tests. The lifetime of the trapped magnetic flux within the FRC is an important parameter affecting the confinement of plasma during the compression and ultimately the final density, temperature, and yield of neutrons from the plasma. Processes occurring during formation, initial plasma temperature, and instabilities in turn all affect the trapped-flux lifetime and the integrity of the FRC. A discussion of FRC parameters measured on FRCHX and efforts that have been made to improve these parameters and the FRC stability will be presented in connection with results from recent FRCHX experiments. This work is supported by DOE-OFES.

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Date submitted: 22 Jul 2013 Electronic form version 1.4