

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Computational Support for FRCHX: Pre-shot and Post-Shot Interactions¹ SHERRY D. FRESE, MICHAEL H. FRESE, NumerEx — Over the next few years, Los Alamos National Laboratory and the U. S. Air Force Research Laboratory Directed Energy Directorate will form, translate, capture, and compress a field reversed configuration (FRC) of magnetized deuterium plasma using an imploding solid liner to achieve magnetic fields more than 10^6 times that of the Earth and plasma pressures of 10^6 atmospheres. These experiments require multiple pulsed power events before FRC compression: formation of the FRC and its translation to and capture in a collapsing magnetic cavity. The FRC must be robust enough to have a long lifetime and yet be small enough to translate quickly and to enter the collapsing magnetic cavity. In early 2010 the team performed over 100 formation, translation, capture (FTC) experiments with a stationary liner and the first complete experiment with an imploding liner (FRCHX) in April. Working with the experimental team, NumerEx has performed integrated simulations of the FTC and FRCHX experiments to aid in the design of both, and to improve the simulations' fidelity. We will present comparisons of measurements from the simulations and experiments, as well as pre- and post-experiment analysis of the first FRCHX.

¹Work supported by the DoE Office of Fusion Energy Science Program on High Energy Density Laboratory Plasmas.

Michael H. Frese
NumerEx

Date submitted: 27 Jul 2010

Electronic form version 1.4