

Abstract Submitted
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Toroidal Field and Magnetic Helicity in a Translating, High-Density Field Reversed Configuration¹ P.E. SIECK, T.P. INTRATOR, G.A. WURDEN, Los Alamos National Laboratory — The ideal Field-Reversed Configuration (FRC) has zero toroidal field, but finite toroidal field and magnetic helicity have been observed in many translating FRCs, especially those formed via conical theta pinch. The appearance of helicity is believed to depend upon the Hall Effect. Other experiments have also observed a reduction of the toroidal field when a translating FRC is arrested in a magnetic mirror, with a corresponding increase in poloidal flux. This suggests a relaxation process that increases beta. We discuss plans to produce FRCs with varying amounts of helicity on the Field Reversed eXperiment-Liner (FRX-L) by using theta coils with a wide range of cone angles. The FRX-L program emphasizes high-density FRCs for use in Magnetized Target Fusion (MTF). Observations of helicity at higher density will improve knowledge of the role of the Hall parameter. Additional helicity may increase the stability of the translating FRC. Helicity content can thus be used to balance plasma beta against stable lifetime to provide an optimum MTF target.

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Paul Sieck
Los Alamos National Laboratory

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