

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

NIMROD Simulations of FRC Formation and Merging R.D. MILROY, PSI-Center & RPPL, U. of Washington, C.C. KIM, PSI-Center, U. of Washington — When FRCs are formed and translated in a conical θ -pinch or by sequencing the coils, a toroidal field is spontaneously generated. This is thought to be due to the action of the Hall term during the reversal process, but previous modeling did not fully explain it [1]. Preliminary studies with NIMROD show that inclusion of the Hall term leads to the generation of both toroidal fields and flows. This will be investigated further with improvements to the radial boundary conditions, and a more detailed study of this phenomenon will be discussed. In addition, a numerical study of the translation and merging of two θ -pinch formed FRCs has begun. Preliminary calculations show that inclusion of the Hall term can have a significant effect on the merging process. Three-dimensional effects have not been a part of past simulations of θ -pinch FRC formation and translation, but will form an important part of this study.

[1] Richard D. Milroy and J.U. Brackbill, “Toroidal magnetic field generation during compact toroid formation in a field-reversed theta pinch and conical theta pinch”, Phys. Fluids **29**, 1184 (1986)

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Date submitted: 16 Jul 2010

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