

Abstract Submitted  
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**Hall MHD Equilibrium of Accelerated Compact Toroids**<sup>1</sup> S.J. HOWARD, D.Q. HWANG, R.D. HORTON, R.W. EVANS, S.J. BROCKINGTON, University of California, Davis — We examine the structure and dynamics of the compact toroid's magnetic field. The compact toroid is dramatically accelerated by a large rail-gun Lorentz force density equal to  $\mathbf{j} \times \mathbf{B}$ . We use magnetic data from the Compact Toroid Injection Experiment to answer the question of exactly where in the system  $\mathbf{j} \times \mathbf{B}$  has nonzero values, and to what extent we can apply the standard model of force-free equilibrium. In particular we present a method of analysis of the magnetic field probe signals that allows direct comparison to the predictions of the Woltjer-Taylor force-free model and Turner's generalization of magnetic relaxation in the presence of a non-zero Hall term and fluid vorticity.

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