

Abstract Submitted  
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**Magnetic Spring Experiment** R. REID, A. HASSAM, J.C. RODGERS,  
University of Maryland — A novel fusion concept, the Thermoelectric Rotating  
Torus [Hassam et al, this meeting], consists of a supersonic, toroidally rotating  
toroidal Z-pinch. This concept requires momentum sources that can drive super-  
sonic rotation at high beta with a strong field. Marshall guns work by simultaneously  
creating a plasma and a magnetic field such that the magnetic pressure accelerates  
the plasma. The maximum magnetic field is, however, limited by the increased  
plasma resistance at high B when the electrons become magnetized. The Magnetic  
Spring Experiment seeks to overcome this limitation by creating a strong magnetic  
field before plasma formation. This is done using a thin metallic foil to carry the  
initial current. The foil breaks at high magnetic pressure and a plasma is formed;  
the device then acts as a Marshall gun but with a pre-established magnetic field.  
A prototype device has been constructed, and preliminary results demonstrate me-  
chanical breaking of the foil and delayed plasma formation. Data will be presented  
from arrays of magnetic pickup coils and photodiodes. Numerical simulations will  
also be presented. Work supported in part by the CMPD and the USDOE.

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