Abstract Submitted
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The Maryland Centrifugal Experiment[1] RICHARD ELLIS, ADIL HASSAM, University of Maryland — The Maryland Centrifugal Experiment(MCX) produces supersonically rotating plasmas in a mirror geometry with a radial electric field produced by a coaxial core biased at high voltage. MCX has achieved high density (n>10**20 m-3) fully ionized plasmas rotating with velocities of ∼100 km/sec for times exceeding 8 ms under a wide range of conditions. Ion temperatures are 30 eV and confinement times ∼100 microseconds. Sonic mach numbers are 1-3 and Alfven mach numbers somewhat less than 0.5; the maximum rotational velocity may be limited by the critical ionization velocity. MCX has achieved its major goals including the demonstration of supersonic rotation, radial velocity profiles with shear sufficient for MHD stability, overall MHD stability, and centrifugal confinement in the axial direction. Upgrade plans include a larger diameter vessel, higher field magnets, and higher discharge voltages. Possible applications to larger experiments will be discussed.

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