Abstract Submitted
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Overview of the Maryland Centrifugal Experiment[1] A.B. HASSAM, University of Maryland, R.F. ELLIS, R. ELTON, R. REID, W. YOUNG, C. ROMERO-TALAMAS, G. TAYLOR, C. TEODORESCU — 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 supersonically with velocities of ∼100 km/sec for times exceeding 8 ms. Centrifugal confinement of the plasma at higher mirror ratio has been unambiguously demonstrated with two IR interferometers and an axial array of diamagnetic loops. The results are compared with an ideal MHD equilibrium model and the agreement is excellent for a wide range of mirror ratio. MCX has now achieved : a) supersonic rotation; b) sheared velocity profiles; c) centrifugal confinement. A high-speed imaging camera has been installed to capture a single image per plasma discharge and reveal the shape of plasma-confining magnetic flux surfaces. A biasable annular limiter is planned to control the radial electric field at the plasma edge. Upgrade plans include more extensive diagnostics, a new core configuration, and an azimuthal B capability, with an emphasis on fluctuation studies.

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Adil Hassam
University of Maryland

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