Abstract Submitted
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Transport Considerations for the Centrifugal Mirror Fusion Experiment[1] A. B. HASSAM, I. ABEL, University of Maryland, College Park, C. A. ROMERO-TALAMAS, University of Maryland, UMBC, B. BEAUDOIN, T. KOETH, University of Maryland, College Park — In a Centrifugal Mirror, plasma is confined in a simple magnetic mirror configuration. Parallel confinement is attained by parallel centrifugal forces from supersonic azimuthal plasma rotation. The usual mirror loss cone is closed at high sonic Mach numbers, Ms. Rotation is maintained by an externally applied radial voltage, V. Momentum losses are from classical cross-field collisional viscosity and parallel losses strongly mitigated by the large Pastukhov factor, exp[Msˆ2/4]. Turbulent losses are expected to be subdominant due to the large velocity shear. Friction generated from the rotation heats the plasma. Perpendicular heat losses are from classical collisional heat conduction; parallel losses are larger but suppressed strongly by the Pastukhov factor. Fusion conditions can be achieved at Mach numbers of 6 to 7. A zero-dimensional code incorporating the above transport features is used to predict performance for the CMFX. For B=0.3T, L=1.3m , a=0.4m, V=80kV, n˜10ˆ18 /mˆ3, we predict ˜1keV temperatures. Work supported by the ARPA-E Grant No. DE-AR0001270.

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Adil Hassam
University of Maryland, College Park

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