

Abstract Submitted
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Experiments on Plasma Injection into a Centrifugally Confined System¹ S. MESSER, R. BOMGARDNER, S. BROCKINGTON, A. CASE, F.D. WITHERSPOON, HyperV Technologies, I. UZUN-KAYMAK, R. ELTON, W. YOUNG, C. TEODORESCU, C.H. MORALES, R.F. ELLIS, University of Maryland - IREAP — We describe the cross-field injection of plasma into a centrifugally-confined system. Two different types of plasma railgun have been installed on the Maryland Centrifugal Experiment (MCX) in an attempt to drive that plasma's rotation. The initial gun was a coaxial device designed to mitigate the blowby instability. The second one was a MiniRailgun with a rectangular bore oriented so that the MCX magnetic field augments the railgun's internal magnetic field. Tests at HyperV indicate this MiniRailgun reaches much higher densities than the original gun, although muzzle velocity is slightly reduced. We discuss the impact of these guns on MCX for various conditions. Initial results show that even for a 2 kG field, firing the MiniRailgun modifies oscillations of the MCX diamagnetic loops and can impact the core current and voltage. The gun also has a noticeable impact on MCX microwave emissions. These observations suggest plasma enters the MCX system. We also compare diagnostic data collected separately from MCX for these and other guns, focussing primarily on magnetic measurements.

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