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Use of a Magnetized Cascade Arc Source in TCSU to Enable RMF Formation of High Temperature FRCs PAUL MELNIK, HOUYANG GUO, ROBERT BROOKS, ALAN HOFFMAN, KENNETH MILLER, RPPL, University of Washington — TCSU can produce 200 eV FRC plasmas out of a weakly ionized gas by means of an azimuthally rotating magnetic field (RMF) and a steady axial bias field. The seed plasma for the RMF driven FRCs is produced by an ultra-high vacuum compatible, magnetized cascade arc source. The arc source has been constructed to translate into the TCSU end section where it is fired in the presence of $\sim$ 150 mT axial magnetic field. This allows the n_e=3.3x10^{19} m^{-3}, T_e=10 eV gun plasma to stream along the axial field to the confinement section where, along with a necessary mid-plane puff of neutral deuterium, it can be used to form and sustain the FRC. Final FRC parameters depend on the condition of the gun plasma and deuterium puff parameters, as well as the degree of deuterium recycling from the wall. A fast ion gauge is used to measure the neutral pressure in the confinement section at the moment of FRC formation. The effect of varying plasma gun conditions and neutral puff parameters on FRC performance is currently being studied and results will be shown.

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