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Magnetized Cascaded Arc Source for Ionization and Fuelling in TCSU P.A. MELNIK, H.Y. GUO, K.E. MILLER, Redmond Plasma Physics Laboratory, University of Washington — An easily translatable, ultra-high vacuum compatible, magnetized cascaded arc source has been designed and constructed to inject a directional plasma beam that will be used as source plasma for RMF driven FRCs in the TCSU experiment. In addition to providing initial background plasma, the arc source can also be run during FRC sustainment to provide steady state plasma fuelling. The deuterium plasma produced by the arc source is tied to the external axial magnetic field lines, providing an ideal pre-ionization source for FRC formation. A 3 kJ, IGBT controlled power supply has also been built and is used for initial breakdown and arc sustainment. Plasma densities of 10^{20} m^{-3} and electron temperatures of 15 eV are anticipated from the device that is currently being tested. Results from these tests and performance during preliminary operation of the TCSU experiment will be reported.

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