**Overview of C-2W Diagnostic Systems and Experimental Results**

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TAE Technologies, Inc. (TAE) in the pursuit of an alternative approach to magnetic confinement fusion, has developed field-reversed configuration (FRC) plasmas composed of mostly energetic and well-confined particles. The high-energy particle population is produced by a state-of-the-art tunable energy neutral-beam (NB) injector system. TAE’s current experimental device, C-2W (a.k.a. Norman) [1], is the world’s largest and best performing compact-toroid system. The plasma parameters of the FRC, high temperature (*Ttot* > 5 keV), high density (ne ~ 1-4 x 1013 cm-3), etc are sustained in steady state for up to 40 ms (limited only by the energy storage on-site) and measured by an extensive array of plasma diagnostic systems (> 70 individual systems), including: magnetics, interferometry, Thomson scattering, a variety of spectroscopic techniques, fusion product detection, neutral particle detection, fast ion detection, fast imaging, bolometry, end-loss analyzers, thermal sensors, etc [2,3]. Active feedback control, driven by the multiple diagnostic systems, is utilized in C-2W to produce repeatable and performance-pushing FRC plasmas. This presentation will give an overview of the various C-2W diagnostic systems and some details about of the results measured by the same.

[1] H. Gota *et al*., Nucl. Fusion 61, 106039 (2021).

[2] M.C. Thompson et al., Rev. Sci. Instrum. 89, 10K114 (2018).

[3] T. Roche, Rev. Sci. Instrum. 92, 033548 (2021)