

Abstract Submitted  
for the DPP19 Meeting of  
The American Physical Society

**Anatomy of an FRC** LOREN STEINHAUER, THOMAS ROCHE, JOSHUA STEINHAUER, TAE Technologies, TAE TEAM TEAM — Advanced beam-driven operation in C-2W produces a steady-state FRC. The baseline diagnostics are external magnetic probe arrays and multi-chord interferometry. The former yields no internal data while the latter only scans the symmetry plane. These measurements are the “tangibles.” Of key interest are “intangibles” not directly measureable, which call for a reconstruction tool that inputs only tangibles. “Grushenka,” developed for this purpose, builds on a modified Grad-Shafranov equation roughly equivalent to a “split-rigid-rotor” distribution of the ion species. Importantly, it accounts for end-loss effects, reducing the density outside the separatrix. Beside the 2D field structure, key intangibles include the trapped flux, currents flowing in core and periphery, inventories in core and periphery, and common stability indices (tilt, interchange, tearing). Grushenka results may answer several critical questions. Does the plasma contain an imbedded FRC at its heart or is it a high-beta mirror with no core of closed field lines? Another question is the link between “positive field index” control and the steady sustainment observed on the C-2W facility.

Loren Steinhauer  
University of Washington

Date submitted: 03 Jul 2019

Electronic form version 1.4