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Diagnostic Overview of the C-2U Advanced Beam-Driven Field-Reversed Configuration Plasma Experiment MATTHEW THOMPSON, HIROSHI GOTA, SERGEI PUTVINSKI, MICHEL TUSZEWSKI, MICHL BINDERBAUER, Tri Alpha Energy, THE TAE TEAM — The C-2U experiment at Tri Alpha Energy seeks to study the evolution of advanced beam-driven field-reversed configuration (FRC) plasmas sustained by neutral beam (NB) injection for 5+ ms. Data on the FRC plasma performance is provided by a comprehensive suite of diagnostics including magnetic sensors, interferometry, Thomson scattering, spectroscopy, bolometry, reflectometry, and NB-related fast-ion/neutral diagnostics. While many of these diagnostic systems were inherited from the preceding experiment C-2 [1,2], C-2U has a variety of new and upgraded diagnostic systems: multi-chord far-infrared polarimetry, multiple fast imaging cameras with selectable atomic line filters, proton detector arrays, and 100 channel bolometer units capable of observing multiple regions of the spectrum simultaneously. In addition, extensive ongoing work focuses on advanced methods of measuring separatrix shape that will both improve accuracy and facilitate active control of the FRC plasma.

[1] M. W. Binderbauer et al., Phys. Plasmas 22, 056110 (2015)
[2] H. Gota et al., Rev. Sci. Instrum. 85, 11D836 (2014)

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