

Abstract Submitted  
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**Fast Filtered Imaging of the C-2U Advanced Beam-Driven Field-Reversed Configuration** E.M. GRANSTEDT, P. PETROV, K. KNAPP, M. CORDERO, V. PATEL, Tri Alpha Energy, AND THE TAE TEAM — The goal of the C-2U program<sup>1</sup> is to sustain a Field-Reversed Configuration (FRC) for 5+ ms using neutral beam injection, end-biasing, and various particle fueling techniques. Three high-speed, filtered cameras are used to observe visible light emission from deuterium pellet ablation and compact-toroid injection which are used for auxiliary particle fueling. The instruments are also used to view the dynamics of the macroscopic plasma evolution, identify regions of strong plasma-material interactions, and visualize non-axisymmetric perturbations. To achieve the necessary viewing geometry, imaging lenses are mounted in re-entrant viewports, two of which are mounted on bellows for retraction during gettering and removal if cleaning is necessary. Images are coupled from the imaging lens to the camera via custom lens-based optical periscopes. Each instrument contains a remote-controlled filter wheel which is set between shots to select a particular emission line from neutral D or various charge states of He, C, O, or Ti. Measurements of absolute emissivity and estimates of neutral and impurity density will be presented.

<sup>1</sup>M. Binderbauer, et al. *Physics of Plasmas* **22**, 056110 (2015)

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