

Abstract Submitted  
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**Design of C-2W Thomson Scattering System** KAN ZHAI, TANIA SCHINDLER, HELEN ZHANG, KURT WALTERS, MATTHEW THOMPSON, THE TAE TEAM, Tri Alpha Energy, Inc. — A suite of multi-point Thomson scattering systems is now being designed and built in parallel with the construction of the C-2W FRC experimental device, which is expected to have a wide range of electron temperature  $T_e$  and density  $n_e$  from edge to center region at different operational phases. The suite consists of two sub-systems that measure  $T_e$  and  $n_e$  profiles at the C-2W central plane and at the jet region. A high-repetition rate Nd:YAG laser is planned for the central plane subsystem for time-resolved profile measurement at 1 kHz. The central plane and jet region subsystems have their own specially-designed collection optics that image 16 and 5 radial points along the laser-beam path onto corresponding surfaces of fiber bundles, which will then relay the collected laser light into dispersing polychromators. The polychromators are designed with five spectral channels with four channels optimized and dedicated to  $T_e$  measurement and one channel dedicated to Rayleigh scattering calibration for  $n_e$  measurement. Detail system design and layout of lasers, beam transportation and stray light control, collection optics and fiber optics, dispersion and detection system and its spectral calibration setup will be presented.

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