

Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Improved density profile measurements in the C-2U advanced beam-driven FRC plasmas MICHAEL BEALL, B.H. DENG, JON SCHROEDER, GREG SETTLES, JOHN KINLEY, HIROSHI GOTA, MATT THOMPSON, Tri Alpha Energy, AND THE TAE TEAM — The goal of Tri Alpha Energy’s C-2U experiment [1] is to demonstrate FRC sustainment via neutral beam injection. Accurate equilibrium profiles are essential for determining optimum operating regimes and studying physics phenomena. Electron density profiles in C-2 [1] were measured by a CO₂/HeNe laser interferometer [2]. All C-2 chords were located below the machine axis causing difficulties due to spatial under-sampling in case of vertical plasma motion. As part of C-2U, additional chords were added above the axis and a complimentary 4-chord far-infrared (FIR) interferometer was developed. The FIR system is based on 2 HCOOH lasers optically pumped by a CO₂ laser. This upgrade allowed for higher density resolution and broad spectral bandwidth. Results of improved density profile measurement will be presented, including fast ion effects. Plasma wobble is also characterized via density centroid measurements.

[1] M.W. Binderbauer *et al.*, Phys. Plasmas **22**, 056110 (2015)

[2] B. H. Deng *et al.*, Rev. Sci. Instrum. **83**, 10E339 (2012)

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Date submitted: 22 Jul 2015

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