

Abstract Submitted
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Overview of the C-2 Field-Reversed Configuration Experimental Program and Future Plan on C-2 Upgrade XIAOKANG YANG, HIROSHI GOTA, MICHL BINDERBAUER, MICHEL TUSZEWSKI, HOUYANG GUO, EUSEBIO GARATE, DAN BARNES, SERGEI PUTVINSKI, TOSHIKI TAJIMA, LEIGH SEVIER, Tri Alpha Energy, Inc. — C-2 is the world's largest compact-toroid (CT) device at Tri Alpha Energy that produces field-reversed configuration (FRC) plasmas by colliding/merging oppositely-directed CTs and seeks to study the evolution, heating and sustainment effects of neutral-beam (NB) injection into FRCs [1, 2]. Recently, significant progress has been made in C-2 on both technology and physics fronts, achieving ~ 5 ms stable plasmas with a dramatic improvement in confinement. FRCs are stabilized with an edge biasing using end-on plasma-guns and/or electrodes, and are partially sustained with NB injection (20 keV Hydrogen, ~ 4 MW). Recent work to reduce scrape-off layer and radiative losses has succeeded in reducing the average power balance deficit to ~ 1.5 MW. Increasing plasma pressure and electron temperature are now observed during brief periods of the discharge, which indicate a sign of NB injection effect such as accumulating fast-ions as well as heating core/edge plasmas. Highlights of these advances, broader C-2 experimental program, and future plan on upgrading the C-2 device with new NBs (15 keV, up to 10 MW injection power, selectable beam injection angle) will be presented.

- [1] M.W. Binderbauer *et al.*, Phys. Rev. Lett. **105**, 045003 (2010).
[2] M. Tuszewski *et al.*, Phys. Rev. Lett. **108**, 255008 (2012).

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