Abstract Submitted
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Overview of the C-2U Advanced Beam-Driven FRC Experimental Program H. GOTA, M.W. BINDERBAUER, T. TAJIMA, S. PUTVINSKI, M. TUSZEWSKI, D. BARNES, S. DETTRICK, E. GARATE, S. KOREPANOV, A. SMIRNOV, M.C. THOMPSON, X. YANG, Tri Alpha Energy, Inc., A.A. IVANOV, BINP, AND THE TAE TEAM — The world's largest compact toroid (CT) device, C-2, has recently been upgraded to C-2U at Tri Alpha Energy to seek for a sustainment of field-reversed configuration (FRC) plasma by neutral-beam (NB) injection [1]. The C-2 experimental program was successfully completed with dramatic improvements in confinement and stability of FRC plasmas, as well as demonstrated plasma pressure increase and plasma heating by NB injection. To enhance the NB injection effect and further improve the FRC performance, the C-2U experimental program has started with following key system upgrades: (i) increased total NB input power to 10+ MW (15 keV hydrogen) with tilted injection angle; (ii) enhanced edge-biasing capability for stability control; (iii) upgraded particle inventory control systems. The initial C-2U experiment has already demonstrated much further improvements, revealing advanced beam-driven FRC plasmas. In the best operating regime we have successfully achieved plasma sustainment up to 5+ ms; while, in the longer-pulsed regime the plasma lifetime can be extended up to the end of NB pulse-duration (8+ ms). The overall C-2U experimental program and the initial experimental results will be presented at the meeting.

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

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