Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Fully-kinetic Ion Simulation of Global Electrostatic Turbulent Transport in C-2U DANIEL FULTON, Tri Alpha Energy, CALVIN LAU, JIAN BAO, ZHIHONG LIN, University of California, Irvine, TOSHIKI TAJIMA, Tri Alpha Energy, THE TAE TEAM TEAM — Understanding the nature of particle and energy transport in field-reversed configuration (FRC) plasmas is a crucial step towards an FRC-based fusion reactor. The C-2U device at Tri Alpha Energy (TAE) achieved macroscopically stable plasmas and electron energy confinement time which scaled favorably with electron temperature[1]. This success led to experimental and theoretical investigation of turbulence in C-2U[2],[3],[4],[5], including gyrokinetic ion simulations with the Gyrokinetic Toroidal Code (GTC). A primary objective of TAE's new C-2W device is to explore transport scaling in an extended parameter regime. In concert with the C-2W experimental campaign, numerical efforts have also been extended in A New Code (ANC) to use fully-kinetic (FK) ions and a Vlasov-Poisson field solver. Global FK ion simulations are presented. Future code development is also discussed. [1] M. Binderbauer et al, Phys. Plasmas 22, 056110 (2015). [2] L. Schmitz et al, Nat. Commun. 7, 13860 (2016). [3] D. P. Fulton et al, Phys. Plasmas 23, 012509 (2016). [4] D. P. Fulton et al, Phys. Plasmas 23, 056111 (2016). [5] C. K. Lau et al, Phys. Plasmas, *accepted for publication* (2017).

Daniel Fulton
Tri Alpha Energy

Date submitted: 13 Jul 2017 Electronic form version 1.4