

Abstract Submitted
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Observation of Super-thermal Plasma & Beam Energization in a Beam Driven Field-reversed Configuration RYAN CLARY, R MAGEE, Tri Alpha Energy, A ROQUEMORE, Princeton Plasma Physics Laboratory, A KOLMOGOROV, A IVANOV, Budker Institute of Nuclear Physics, S KOREPANOV, Tri Alpha Energy, S MEDLEY, Princeton Plasma Physics Laboratory, A SMIRNOV, Tri Alpha Energy, M TIUNOV, Budker Institute of Nuclear Physics, TAE TEAM TEAM¹ — C-2U is an advanced beam driven field-reversed configuration (FRC) plasma confinement experiment which sustains the configuration for > 5 , in excess of typical MHD times as well as fast particle instability and slowing down times². The dynamics of fast particles from hydrogen neutral beam injection are critical to the deuterium FRC performance. To improve our understanding of the effects of fast particles in this system an $E\parallel B$ neutral particle analyzer ³ was acquired which simultaneously measures H^0 and D^0 flux with high energy resolution. In addition, a small, high purity, ion beam system was constructed and used to calibrate the absolute response of this device. Measurements from this NPA reveal a super-thermal population in the FRC (deuteron) plasma distribution as well as a fast ion (proton) distribution above the beam injection energy.

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²M. W. Binderbauer, et al. *Physics of Plasmas*, 22(5):056110, 2015

³S. S. Medley and A. Roquemore. *Review of Scientific Instruments*, 75(10):3625–3627, 2004

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