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Abstract Submitted
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Observation and suppression of a new fast ion driven micro burst instability in a field-reversed configuration plasma B.H. DENG, S. KOREPANOV, Tri Alpha Energy, Inc., E. BELOVA, PPPL, J. DOUGLASS, M. BEALL, M. BINDERBAUER, R. CLARY, S. DETRICK, E. GARATE, H. GOTA, E. GRANSTEDT, R. MAGEE, A. NECAS, S. PUTVINSKI, T. ROCHE, A. SMIRNOV, T. TAJIMA, M THOMPSON, M. TUSZEWSKI, A. VAN DRIE, Tri Alpha Energy, Inc., TAE TEAM — The C-2U experiment offers a unique plasma environment combining a high beta field reversed configuration (FRC) embedded in a low beta magnetic mirror with high power neutral beam injection. The beams are injected tangentially into a modest magnetic field so that the orbits of the resulting fast ions encircle the entire plasma. The dominant population of large orbit fast ions sustains and stabilizes the FRC, suppresses turbulence, and makes a dramatic beneficial impact on the overall plasma performance [1]. Abundant interesting new physics phenomena are observed in this high performance FRC operation regime, including micro bursts, which are benign, periodic bursting small amplitude down chirping fluctuations seen by several diagnostics. Detailed analysis of the micro bursts measurement data, bulk plasma equilibrium profiles, and fast ion orbit characteristics show that the micro bursts might be driven by a small number of resonant fast ions [2], and can be suppressed when the number of resonant particles is reduced. [1] M. Binderbauer *et al.*, Physics of Plasmas, 22, 056110 (2015). [2] E.V. Belova, Bull. of Am. Phys. Soc., **58**, p. 128, GP8 54 (2013).

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