

Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Far infrared laser polarimetry development for the C-2 field reversed configuration plasmas BIHE DENG, HIROSHI GOTA, KURT KNAPP, RICARDO MARTINEZ, Tri Alpha Energy, Inc., TAE TEAM — Toroidal magnetic field (Btor) has been observed in field reversed configuration (FRC) plasmas by probes. The existence of Btor will affect the FRC plasma equilibrium. Monitoring the evolution of Btor may enhance the understanding of the colliding/merging process of two FRCs and other physics phenomena such as the origin of Btor. In the high temperature C-2 FRC plasmas [1], internal probes are very perturbing, making it difficult to interpret the data. For non-perturbing measurement of Btor in C-2, a two-chord far infrared (FIR) laser polarimetry diagnostic system has been developed. It is based on two CO₂ laser pumped formic acid vapor lasers operating at a wavelength of 432.6 μm . Phase resolution of 0.1° at 50 kHz bandwidth has been achieved in laboratory test. The diagnostic system will be installed on the C-2 device and preliminary experimental results will be presented.

[1] M. Tuszewski et al., Phys. Rev. Lett. 108, 255008 (2012)

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Date submitted: 11 Jul 2013

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