

Abstract Submitted  
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**Charge separation and transport of the n=2 instability in C-2 FRC plasmas** BIHE DENG, XUAN SUN, MICHEL TUSZEWSKI, Tri Alpha Energy, Inc., TAE TEAM — Charge separation is critical in the positive feedback loop for gravitational type instabilities to grow [1], such as in the case of the n=2 mode in the C-2 field reversed configuration (FRC) experiment [2]. A fast time response Langmuir probe with minimum perturbation to the plasma is inserted into the edge of the C-2 plasma to measure the plasma floating potential. With the combined plasma wobble motion and spin motion, 2-D scans of the plasma floating potential are obtained, and evidence of charge separation associated with the n=2 instability is observed. The transport due to charge separation is estimated. Charge neutralization can provide an alternative method to stabilize the n=2 mode. An experiment is proposed to test this method with two probes inserted into the plasma from two azimuthally separated ports and an external shorting circuit, to constantly neutralize the charge separation, thus suppress the growth of the n=2 mode.

[1] R.J. Goldston and P.H. Rutherford, *Introduction to Plasma Physics* (Institute of Physics Publishing, Bristol, 2000).

[2]. M.W. Binderbauer *et al*, Phys. Rev. Lett. **105**, 045003 (2010).

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