

Abstract Submitted  
for the DPP13 Meeting of  
The American Physical Society

**Dependence of ion dynamics on upstream density asymmetry and guide field**<sup>1</sup> JONGSOO YOO, MASA AKI YAMADA, HANTAO JI, CLAYTON MYERS, JONATHAN JARA-ALMONTE, CHARLES SWANSON, PETER BOLLGERT, Princeton Plasma Physics Laboratory — In the Magnetic Reconnection Experiment (MRX), the upstream density ratio and guide field strength are systematically varied to study their effect on the observed ion dynamics. The guide field significantly modifies both the Hall current profile and the in-plane electrostatic potential, thereby changing the ion flow profile. The ion outflow speed decreases as the guide field increases, which is consistent with a previous study [1]. The upstream density asymmetry also breaks the symmetry of the ion flow pattern and quadrupole field. The stagnation point of the ion flow is shifted to the lower density side, and the magnitude of the quadrupole field is larger on the higher density side. These observations are consistent with recent numerical simulation results. The radial pressure balance and reconnection rate with different upstream density ratios are also discussed.

[1] T. Tharp *et al.*, *Phys. Rev. Lett.*, **109**, 165002, 2012

<sup>1</sup>This work is supported by DOE and NSF.

Jongsoo Yoo  
Princeton Plasma Physics Laboratory

Date submitted: 11 Jul 2013

Electronic form version 1.4