

Abstract for an Invited Paper  
for the APR06 Meeting of  
The American Physical Society

**High velocity plasma jets and 3D magnetic structure in the Swarthmore reconnection experiment<sup>1</sup>**

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Several new experimental results are reported from plasma merging studies at the Swarthmore Spheromak Experiment (SSX) with relevance to three dimensional magnetic reconnection in laboratory and space plasmas. First, recent high-resolution velocity measurements of impurity ions using ion Doppler spectroscopy (IDS) show bi-directional outflow jets at 40 *km/s* (nearly the Alfvén speed). Second, ion heating to nearly  $10^6$  *K* is observed after reconnection events in a low density regime. Third, the out-of-plane magnetic field in a reconnection volume shows a quadrupolar structure at the ion inertial scale ( $c/\omega_{pi}$ ). Time resolved vector magnetic field measurements on a 3D lattice ( $\mathbf{B}(\mathbf{r}, t)$ ) enables this measurement. Each of these measurements will be related to and compared with similar observations in a solar or space context.

<sup>1</sup>supported by DOE, NSF, and Center for Magnetic Self Organization