

Abstract Submitted
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Flow measurements in spheromak merging experiments¹ C.D. COTHRAN, J. FUNG, M.R. BROWN, Swarthmore College, M.J. SCHAFFER, General Atomics, E.V. BELOVA, PPPL — Results of time resolved multi-chord ion doppler spectroscopy (IDS) studies at the Swarthmore Spheromak Experiment (SSX) are reported. SSX is capable of producing several types of compact toroidal configurations using one or both opposed spheromak sources. A field reversed configuration (FRC) well described by MHD is produced when counter-helicity spheromaks are merged. After a brief dynamic period, co-helicity merging produces a single large fully tilted spheromak or possibly a short Taylor helix. IDS measurements are complete on each of these configurations; Abel inverted midplane flow profiles will be presented. Magnetic studies indicate the FRC should contain a radially sheared toroidal flow at the midplane to support remnant anti-parallel toroidal fields observed at the ends. IDS measurements during the reconnection phase of FRC formation is characterized by double gaussian lineshapes separated by $0.4v_A$, consistent with bi-directional reconnection outflow.

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