Abstract Submitted
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Taylor State Merging Experiments at SSX[1] KAITLIN GELBER, ADAM LIGHT, MICHAEL BROWN, Swarthmore College — We are studying magnetic reconnection that occurs with the high-velocity (40 km/s) merging of two Taylor state plasmas in SSX. We are using the merging configuration previously used by Gray, *et al*[1] ($L = 0.86\ m, R = 0.17\ m$). We record the ion temperature with ion Doppler spectroscopy, and electron density with a Helium-Neon interferometer. Magnetic field vectors $\mathbf{B}$(t) are measured with a 2D probe array at the midplane. We time the Taylor states so that both arrive at the center of the probe array within a microsecond. We have examined both co-helicity and counter-helicity merging of the Taylor states. Preliminary results show an increase in the magnetic field strength and electron density at the midplane, followed by an increase in ion temperature. We find the density to be ($\geq 0.5 \times 10^{16}\ cm^{-3}$), proton temperature ($\geq 20\ eV$), and magnetic field ($0.3\ T$) of relaxed helical Taylor states. [1]Gray *et. al.*, Phys. Rev. Lett. 110, 085002 (2013).

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Kaitlin Gelber
Swarthmore College

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