

Abstract Submitted
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Acceleration of Taylor plumes on SSX for magneto-inertial fusion¹ M. R. BROWN, M. KAUR, J. E. SHROCK, E. M. SUEN-LEWIS, L. J. BARBANO, S. NAMBIAR, Swarthmore College, D. A. SCHAFFNER, Bryn Mawr College — We have added two pinch coils to the glass extension of the SSX plasma wind tunnel device in order to accelerate Taylor plumes to over 100 *km/s*. We have characterized velocity (40 *km/s*), density ($0.4 \times 10^{16} \text{ cm}^{-3}$), proton temperature (20 *eV*), and magnetic field (0.2 *T*) of relaxed, unaccelerated helical Taylor states [1]. Our goal is to accelerate the Taylor states to over 100 *km/s* and compress to small volumes by stagnation. Compression by a factor of ten to increase both density and temperature will put the Taylor state in a suitable parameter regime as a magneto-inertial fusion target. One prototype pinch coil operates at 1 *kJ* (1.3 μF , 40 *kV*) and the other operates at 2 *kJ* (3 μF , 40 *kV*). Both have quarter-cycle rise times of less than 1 μs . Results from both prototype units will be presented. [1] Gray, et al, PRL **110**, 085002 (2013).

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