Abstract Submitted
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Oblate Field Reversed Configurations (FRCs) in SSX[1] T. GRAY, Swarthmore College, M.R. BROWN, B.S. GERBER-SIFF, K.R. LABE, E.H. DEWEY, L.D. BOOKMAN, M.J. SHAFFER, General Atomics, C.D. COTHRAN, Haverford College — FRCs offer closed magnetic field line confinement and plasma exhaust along open lines; and, as with other true compact tori (CTs), the plasma is not linked by magnet windings. Oblate FRCs would make more compact fusion reactors than prolate ones if plasma diffusivities are equal. Preliminary results in a new oblate flux conserver ($R = 0.25\ m, L = 0.4\ m$) designed to stabilize long-wave m=1 kink instabilities in SSX demonstrated magnetically quiet FRCs. However, the excitation of unstable MHD modes occurs during most discharges. The SSX FRCs are formed by merging two spheromaks of opposite magnetic helicities, enabling the creation of FRCs with high internal poloidal flux. The FRC equilibria are diagnosed by inserted magnetic probes. Ion Doppler spectroscopy shows $T_i \approx 80$ eV shortly after reconnection and $T_e \approx 20$ eV, but temperature profiles have not yet been resolved. Ion gyro orbits are much smaller than the plasma radius, so these plasmas are fluid, not kinetically, dominated. Work on stabilizing the FRCs will be discussed.

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