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Overview of the Flux-Coil-Generated Field-Reversed Configuration N. BOLTE, H. GOTA, D. GUPTA, V. KIYASHKO, M. MOREHOUSE, N. ROSTOKER, Tri Alpha Energy, Inc., T. ROCHE, F. WESSEL, University of California, Irvine — A Flux-Coil-Generated Field-Reversed Configuration (FRC) device has been assembled with the goal of producing an FRC dominated by large-orbit ions. The inner (flux) coil is used to pre-ionize the working gas and then accelerate the plasma into an FRC while the outer (limiter) coil provides the axial bias field. Two chords of infrared interferometry at 12 and 20 cm radii measure the electron density. Spectroscopy monitors NII ($\lambda = 568$ nm) at an 18-cm radial chord to measure ion temperature and rotational energy. Three magnetic probe arrays are located outside of the chamber, through the midplane, and at the axial end of the FRC. During the more quiescent portion of the FRC, the magnetic field-null $r_0 \sim$ 20-24 cm, the separatrix $r_s \sim$ 27-30 cm, the field-reversal $\Delta B \sim$ 300-500 G, the electron density $n_e \sim$ 2-9$\times 10^{13}$ cm^{-3}, the ion temperature $T_i \sim$ 20-40 eV and the ion rotational energy $E_{i\theta} \sim$ 7-19 eV. Ongoing neutral particle analyzer studies suggest even higher rotational energy. The FRC plasma lifetime is $\tau \sim$ 60-100 μs.

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