

Abstract Submitted
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Measurement of Axial Plasma Losses in the C-2W High-Performance Regime MARTIN GRISWOLD, PETER YUSHMANOV, AND THE TAE TEAM, TAE Technologies, Inc. — In TAE Technologies' current experimental device, C-2W (also called Norman) ¹, record breaking, advanced beam-driven field reversed configuration (FRC) plasmas are produced and sustained in steady state utilizing variable energy neutral beams (15 – 40 keV, total power up to 20 MW), advanced divertors, end bias electrodes, and an active plasma control system. In C-2W, the FRC core plasma is surrounded by a mirror-confined scrape-off layer on open field lines. An array of energy analyzers and bolometers mounted in the divertors of C-2W ² measure axial power losses as well as the electron temperature and ion energy distribution of the plasma at the termination point of the open field lines. Measurements taken in the C-2W high-performance regime show bulk ion temperatures greater than 500 eV that are sustained throughout the shot. They also indicate that a strong ambipolar potential ($\sim 4.5 T_e$) develops along the open field lines to control electron losses, and that the energy lost per ion, η_e , is close to the theoretical minimum.

¹H. Gota et al., Nucl. Fusion **59**, 112009 (2019)

²M. E. Griswold et. al., Rev. Sci. Instrum. **89**, 10J110 (2018)

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