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Parametric study of gas fueling and end biasing in the C-2W advanced FRC M. KAUR, TAE Technologies Inc., University of California, Irvine, P. YUSHMANOV, E. TRASK, D. GUPTA, K. ZHAI, E. PARKE, THE TAE TEAM, TAE Technologies Inc. — In TAE Technologies experimental device, C-2W (also called Norman), record breaking, advanced beam-driven field-reversed configuration (FRC) plasmas are produced. Long-lived, hot FRCs with excluded flux radius up to 50 cm are sustained in steady state in the central confinement vessel by utilizing several advanced subsystems. These subsystems include variable energy neutral beams, advanced divertors, end bias electrodes, variable axial magnetic field and mirrors, fueling setup, and an active plasma control system. In this presentation, we discuss the effect of these external parameters on various C-2W plasma parameters. Preliminary analysis shows that plasma temperature is strongly correlated with the biasing voltage, V_{bias} and hence, to the biasing power at low biasing currents, I_{bias}. Plasma density increases with I_{bias} in a limited range. An upper limit on gas fueling required to form a hot, dense plasma is observed. Gas fueling above this limit leads to higher I_{bias} and reduction in V_{bias}. Effect of gas fueling location will also be discussed.

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