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Direct Measurement of Injected Neutral Beam Power in C-2W JAMES TITUS, SERGEY KOREPANOV, KONSTANTIN PIROGOV, KURT KNAPP, 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. Heating, current drive, and refueling from neutral beam injection are essential to FRC sustainment. Previously, evaluating injected neutral power relied on the modeling of neutralization and duct losses. A new tungsten wire calorimeter has been designed, built, calibrated on a test stand, and implemented in the confinement vessel to make the first direct measurements of the injected beam power into C-2W. An array of 8 wires are arranged along the beam injection port so that the beam power deposition profile can be reconstructed to find the total injected power. We will report on the calorimeter design, calibration methods, and early experimental results from C-2W, including the optimization effort to increase the input power by improving beam aiming and neutralization. [1] H. Gota et al, Nucl. Fusion **59**, 112009 (2019)

> James Titus TAE Technologies, Inc.

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