

Abstract Submitted
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Tomography on C-2W: First Results from Reconfigured 300-Channel Bolometry System ANTON BONDARENKO, TAE TEAM, TAE Technologies — 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), expander divertors, end bias electrodes, and an active plasma control system. Tomography offers a valuable and non-invasive diagnostic of the FRC plasma, as tomographic reconstructions of the emission profile yield important information on plasma shape, density, transient MHD behavior, and power loss due to radiation and particle flux. Recently, a bolometer system on the C-2W device has been reconfigured with the primary goal of providing tomographic reconstructions of the FRC. The overhauled system consists of 300 photodiode channels with unique lines of sight that intersect a toroidal plane of the FRC near the mid-plane. The photodiodes sense a broad range of wavelengths (including XUV and soft x-rays) as well as charged particles. In addition, thin metallic optical filters on roughly one-third of the channels allow for coarse spectral resolution. Reconstructions of the FRC emission profile are performed via several different tomographic methods, and the results are compared to well-known FRC equilibrium models. The proper treatment of solid angle in the tomographic reconstructions is also discussed. [1] H. Gota et al, Nucl. Fusion **59**, 112009 (2019).

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