

Abstract Submitted
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Performance Measurements on the ECH/ECCD Top Launch System on the DIII-D Tokamak¹ P.W. SIMMERLING, U. Connecticut, A. TRUJILLO, U. Nacional de Ingenieria, Lima, PERU, R. BRAMBILA, M. CENGHER, W.H. GROSNICKLE, J.M. LOHR, D. PONCE, A. TORREZAN, H. TORREBLANCA, General Atomics — On DIII-D, a new ECH installation is being tested which uses a flexible system in which a gyrotron operating at 117.5 GHz is installed in the top launch configuration. Experiments at TCV [1] showed that increased heating efficiency at the 3rd harmonic could be achieved with this vertical launch geometry, where the rf beam trajectory is approximately parallel to the resonance for a longer distance and the Doppler shift for the resonant electrons was higher than for low-field-side (LFS) injection [2]. Although important advantages are obtained by driving localized current in the plasma, a difficulty is that the current drive efficiency is relatively low, particularly when current drive is required at intermediate radii for advanced tokamak performance or for NTM suppression. Top launch current drive can be compared with LFS launch and is expected to increase the driven current. In addition to the 117.5 GHz frequency, a second frequency, 110 GHz, can also be used. A description of the installation, measurements of the top launch transmission line performance, and the status of the experiments will be reported.

[1] Alberti, S., et al., Nuclear Fusion, 45, 11, 1224-1231 (2005)

[2] Chen, X., et al., EPJ Web of Conferences, 203, 01004 (2019)

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