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The 110 GHz System for ECH and ECCD on DIII–D[1]

JOHN LOHR, DAN PONCE, H. IKEZI, R.W. CALLIS, R.C. O'NEILL, T.C. LUCE, R. PRATER, C.C. PETTY, General Atomics — A high power rf system consisting of two gyrotrons in the 1 MW class at 110 GHz has been commissioned on the DIII–D tokamak. Generated power up to 1.6 MW and 75% transmission to DIII–D has been achieved. The beams can be scanned poloidally between tokamak discharges and launchers for oblique and perpendicular injection have been used. Arbitrary elliptical polarization can be set remotely using pairs of grooved mirrors in the transmission line miter bends. The system has been operated regularly for experiments on current drive and transport and to enhance the efficiency of other processes such as fast wave current drive. Characterization of the system has included measurements of the power deposition profile for different polarizations of the rf beam, qualification of the evacuated transmission lines and exploration of performance and parameter space for gyrotron operation. Single gyrotron performance of 1.09 MW for 600 ms and 860 kW for 2.0 s pulses was demonstrated. Output power modulation up to 20 kHz was tested. A third 110 GHz gyrotron with a diamond window is planned for installation this year and should be capable of generating greater than 1.0 MW for 2.0 s pulses.

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[X] Prefer Oral Session
[ ] Prefer Poster Session

Special instructions: DIII–D Oral Session I, immediately following Petty

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