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Category Number and Subject:

Theory      Experiment

**Progress Report on the DIII-D ECH System,\*** J. Lohr, M. Cengher, J.L. Doane, Y.A. Gorelov, H.J. Grunloh, C.P. Moeller, D. Ponce, *General Atomics* – The DIII-D six gyrotron system is a primary experimental tool fulfilling a variety of unique requirements. The system operates at 110 GHz, injecting up to 3.5 MW for pulses up to 5 s in length. The peak injected energy has been 16.6 MJ for a single tokamak pulse. As the capabilities were steadily being upgraded, the system has performed with good reliability. Recently improved procedures for alignment of the rf beams at the waveguide inputs have reduced mode conversion, giving -1 dB transmission losses, the expected value for 90 m waveguide length with 12 miter bends per line. Real time steering of the launcher antennas has demonstrated NTM suppression under control of the DIII-D operating system with current drive swept across the resonant flux surface for the  $m/n=3/2$  island. Injected power up to 5 MW will be realized by addition of a 7th gyrotron, by reduction in the number of miters, and by installation of new lower loss miters in the system. Planning has begun for a further significant upgrade to generated power up to 15 MW with a 5% increase in rf frequency.

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