

## The 110 GHz ECH Installation on DIII-D: Status and Initial Experimental Results\*

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Two 110 GHz gyrotrons with nominal output power of 1 MW each have been installed on the DIII-D tokamak. The gyrotrons, produced by Gycom and CPI, are connected to the Tokamak by windowless evacuated transmission lines using circular corrugated waveguide carrying the HE<sub>11</sub> mode. Initial experiments with the Gycom gyrotron showed good central heating efficiency at the second harmonic resonance with record central electron temperatures for DIII-D in excess of 10 keV achieved.

The beam spot in the DIII-D vacuum vessel was well focused, with a diameter of approximately 6 cm, and it could be steered poloidally by a remotely adjustable mirror. The injection was at 19 degrees off perpendicular for current drive and the beams could be modulated for studies of energy transport and power deposition. The system will be described and the initial physics results will be presented including heating efficiencies, power deposition profiles and MHD determination of the change in plasma energy under application of ECH. Extensive calorimetry and analysis of the performance of the beam transport system have been done and these results will also be presented. A third gyrotron, also at 110 GHz, will be installed later this year. Progress with this CPI tube will be discussed and future plans for the ECH installation and physics experiments using it will be presented.

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