

## HIGHER POWER OPERATION OF THE ECH SYSTEM ON DIII-D<sup>\*</sup>

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A high power, long pulse 110 GHz electron cyclotron system is in operation on the DIII-D tokamak. Up to six gyrotrons have been operated simultaneously for plasma physics experiments. Following a vacuum failure on one of these tubes, five gyrotrons are still in productive service. In the location previously occupied by the failed gyrotron, the DIII-D program will test a new single stage depressed collector gyrotron, which has been designed to generate 1.5 MW. It is possible that quasi-continuous operation at full power will be achieved with this development unit. The rf generated by these gyrotrons is transmitted to the tokamak by a 90 m long evacuated corrugated wave guide which incorporates polarization control, path switching, isolation, beam pointing and rf power measurement functions. The components of these lines were designed to operate at 1.0 MW for up to 10 s pulse length. Increasing the generated power will require modifications to some of the components. Tests of the thermal performance of the most critical of these components and the design modifications required to accommodate 1.5 MW operation, initial test results for the 1.5 MW gyrotron and the long term upgrade plans for the DIII-D ECH installation will be presented.

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