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Theory Experiment

Status and Plans for the 110 GHz ECH/ECCD System on DIII-D,* J. Lohr, I.A. Gorelov, H.J. Grunloh, D. Ponce, *General Atomics*, M. Cengher, *ORISE* – There are now 5 gyrotrons in operation on DIII-D, producing 4 MW at 110 GHz for pulse lengths which are limited administratively to 5 s. The efficiency of transmission from the gyrotrons to the tokamak is about 80%, resulting in over 3 MW injected power. A sixth gyrotron is being repaired and will begin operation when a high voltage power supply now under construction is available. Stress fractures of the collectors due to cyclic fatigue resulted in vacuum failures on three of the first group of gyrotrons in the installation. New algorithms and equipment for sweeping the electron beams in the collectors have reduced the peak power loading in the collectors to levels $< 600 \text{ W/cm}^2$, which results in predicted lifetimes of 50,000 gyrotron pulses where the fatigue limit is now determined not by single pulse stress but by fatigue due to the 5 Hz sweeping of the electron beam. A new fast fault processing system based on FPGA technology is being commissioned.

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