Abstract Submitted
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Operation of the Complete DIII-D Gyrotron System[1] J. LOHR, M. CENGHER, J.L. DOANE, Y.A. GORELOV, H.J. GRUNLOH, C.P. MOELLER, D. PONCE, R. PRATER, GA — The 110 GHz six gyrotron system on the DIII-D tokamak has been completed and is now in routine operation in support of experiments. The gyrotrons can be modulated using preprogrammed waveforms at frequencies greater than 5 kHz or under control of the DIII-D Plasma Control System using feedback on various signals, such as Te from fast ECE and fluctuations from magnetic probes. Full control of the elliptical polarization of the injected rf is provided and the individual rf beams can be steered over 40° both poloidally and toroidally. Reliability of 90% has been achieved. The system has been used for rf pulses up to 5 s in length, injecting over 3 MW into the plasma limited by transmission line efficiency with maximum injected energy over 12 MJ for a single tokamak pulse. The system has been used in instability suppression and to rock the T_e gradient periodically for transport studies. The ECH power has initiated the discharge for breakdown studies and for solenoidless startup and created and maintained H-modes without particle injection. An upgrade to 8 gyrotrons is planned.

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