

Abstract Submitted
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Initial Electron Cyclotron Heating Experiments at 110 GHz in DIII-D,¹ R. PRATER, R.W. CALLIS, J.M. LOHR, T.C. LUCE, J.F. TOOKER, General Atomics, D. ZHANG, Institute of Plasma Physics, Academia Sincia, L. POPOV, Gycom, M. MURAKAMI, Oak Ridge National Laboratory, J.A. KONINGS, Association Euratom-FOM — First operation of a 110 GHz, 0.75 MW Gycom gyrotron has been made for plasma heating in DIII-D. The gyrotron has an internal mode converter and an external matching optics unit which couples power to the waveguide in the low loss $HE_{1,1}$ mode. The corrugated waveguide of inside diameter 31.75 mm is evacuated for operation and has no vacuum barrier window at the tokamak vessel. After a brief conditioning period operation of the waveguide was highly reliable. For nominal operation of the gyrotron at 0.7 MW, about 0.4 to 0.5 MW was absorbed in the plasma. Central electron heating to temperatures above 7 keV was observed at low density, $0.7 \times 10^{19} \text{ m}^{-3}$. Steering of the microwave beam in the vertical direction by rotation of the final mirror produced on- and off-axis heating. For off-axis heating the increase in stored energy was about the same as for on-axis heating and the temperature profile was still peaked, suggesting that a heat pinch may be present.

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