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Category Number and Subject: 5.6.2 DIII-D Tokamak

Theory     Experiment

**Diamond Windows on the 110 GHz Gyrotrons at DIII-D,\*** I.A. Gorelov, J.Lohr, D.Ponce, R.W. Callis, *General Atomics*, K.Kajiwara, *ORISE* – Artificial chemical-vapor-deposition diamond has gained acceptance by the rf physics community as the best material for output windows of high power microwave generators, especially gyrotrons. The development of gyrotrons with megawatt output power level and several hundred seconds pulse duration at frequencies greater than 100 GHz has only been possible through use of these windows. Diamond window gyrotrons are in regular service on ASDEX-U, DIII-D, JT-60U, TCV and TORE-SUPRA and are planned for ITER. The importance of this material in this application has led to extensive research on properties, manufacturing and measurement techniques and handling of these windows. In this presentation, infrared measurements on three different diamond windows passing up to 1 MW rf power at 110 GHz for 5 s are reported. Differences in temperature profiles among the windows have been correlated with contamination of diamond surfaces arising during brazing of the window flanges and have been used to diagnose the condition of the windows.

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