

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Operations Studies of the Gyrotrons on DIII-D¹ STEPHEN STORMENT, University of Arkansas - Fayetteville, JOHN LOHR, MIRELA CENGHER, YURI GORELOV, DAN PONCE, ANTONIO TORREZAN, General Atomics — The gyrotrons are high power vacuum tubes used in fusion research to provide high power density heating and current drive in precisely localized areas of the plasma. Despite the increasing experience with both the manufacture and operation of these devices, individual gyrotrons with similar design and manufacturing processes can exhibit important operational differences in terms of generated rf power, efficiency and lifetime. This report discusses differences in the performance of several gyrotrons in operation at DIII-D and presents the results of a series of measurements that could lead to improved the performance of single units based on a better understanding of the causes of these differences. The rf power generation efficiency can be different from gyrotron to gyrotron. In addition, the power loading of the collector can feature localized hot spots, where the collector can locally be close to the power deposition limits. Measurements of collector power loading provide maps of the power deposition and can provide understanding of the effect of modulation of the output rf beam on the total loading, leading to improved operational rules increasing the safety margins for the gyrotrons under different operational scenarios.

¹Work supported by US DOE under DE-FC02-04ER54698

Stephen Storment
Univ of Arkansas-Fayetteville

Date submitted: 13 Jul 2017

Electronic form version 1.4