Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Improved RF Phase and Amplitude Detection for ICRF Heating Experiments[1] A. SANCHEZ, U. New Mexico, R.I. PINSKER, General Atomics, F.W. BAITY, ORNL, A. EGUIZABAL, E. FREDD, N. GREENOUGH, A. NAGY, PPPL — For diagnosis and control of high-power rf heating systems, it is necessary to measure the rf amplitude and phase of signals at multiple points in the rf transmission lines. We are upgrading the signal processing modules used in the fast-wave system on the DIII-D tokamak to improve reliability and temporal resolution. The goal is to enable resolution of phenomena on microsecond timescales for studies of antenna arcing and ELMs. This work compares several possible approaches to this upgrade, including ICs that contain most of the functionality of the original designs on a single chip, schemes involving digitizing the rf in bursts, and updates of the existing systems. The techniques are compared in the achievable time resolution, accuracy, precision, dynamic range and unit cost.

[1]Work supported by the US DOE under DE-FC02-04ER54698, DE-AC05-00OR22725, and DE-AC02-09CH11466 and the National Undergraduate Fellowship in Fusion Science and Engineering.

Bob Pinsker
General Atomics

Date submitted: 16 Jul 2010 Electronic form version 1.4