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Category Number and Subject: 5.6.2 DIII-D Tokamak

[ ] Theory [x] Experiment

Upgraded Two-Color Heterodyne Interferometer System on DIII-D and Its Use as a Fluctuation Diagnostic,* M.A. VanZeeland, ORISE, T.N. Carlstrom, *GA,* D.K. Finkenthal, T. Deterly, *Palomar College* – The two-color, heterodyne, CO_2 interferometer system at DIII-D has undergone an upgrade to an all digital phase demodulation scheme based on modern digital signal processing techniques implemented using versatile field programmable gate array technology and high speed analog-to digital converters. The real-time system is capable of 1/3 degree phase detection accuracy with 8 MHz bandwidth independent of IF amplitude variations up to 20%. The very high accuracy and bandwidth of the upgraded interferometer makes its use as a fluctuation diagnostic practical for the first time. Preliminary physics results using the upgraded system will be discussed.

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