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, CO₂ 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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