

CO₂ Interferometer Error Correction and Upgrade on the DIII-D Tokamak*

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A multichannel, two-color, quadrature heterodyne interferometer has provided reliable line-averaged density measurements on the DIII-D tokamak for nearly 20 years. In the interest of upgrading the existing system for increased accuracy and robustness the major sources of phase measurement error have been characterized and a method for post-shot error correction has been developed. The error correction scheme exploits the facts that the dominant error introduced by the phase comparator is periodic and that measurements of both vibration and density are continued for sufficient time after shut-off such that the plasma density is zero. Future plans which include a transition to digital phase demodulation as well as increased spatial resolution will be discussed.

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