

Abstract Submitted
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Turbulence measurements with fast two-color interferometry on Alcator C-Mod CALE KASTEN, JAMES IRBY, RICHARD MURRAY, ANNE WHITE, NATHAN HOWARD, YIJUN LIN, PAUL BONOLI, Plasma Science and Fusion Center, Massachusetts Institute of Technology — The two-color interferometer diagnostic on Alcator C-Mod has been upgraded to simultaneously measure line-integrated electron density and density gradient fluctuations for turbulence and transport studies. Signals from ten vertical-viewing CO₂ laser chords are demodulated relative to a local oscillator with fast analog in-phase/quadrature electronics using a heterodyne technique, giving the line-integrated electron density and fluctuations. The chord signals are also demodulated relative to adjacent chords, providing a measurement of the line-integrated electron density gradient and fluctuations. The diagnostic design, calibration, and analysis methods are presented. Phase and wavenumber sensitivities are determined and a synthetic diagnostic is developed which enables quantitative comparisons between experimental measurements and gyrokinetic simulations using GYRO. The diagnostic is used to study changes in turbulence due possibly to strong electron heating and $E \times B$ shear flow in the ion cyclotron range of frequencies during mode conversion flow drive and heating experiments.

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