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Multi-chord Faraday-Effect measurements of fluctuations in C-Mod WILLIAM BERGERSON, UCLA, P. XU, MIT, D.L. BROWER, W.X. DING, UCLA, J.H. IRBY, MIT — Three chords measuring the Faraday effect are operated routinely across all machine conditions in C-mod and allow for internal measurements of the equilibrium poloidal magnetic field. Absolute error attributed to stray magnetic field effects is below 0.5 degree and noise related to contamination from the lower hybrid and ion cyclotron radio frequency systems are not observed. Tests indicate there is no measurable signal contamination from the toroidal magnetic field due to the Cotton-Mouton effect or misalignment. Polarization sensitivity of the wire mesh beamsplitters requires system calibration which is achieved using a rotating half-wave plate. Individual channels can be modified to measure the Cotton-Mouton effect directly and yield a line integrated density measurement without "fringe skips." Fluctuations on the Faraday signal associated with sawteeth, tearing modes, the quasi-coherent mode, broadband turbulence, and fast particle driven modes are observed at frequencies up to 1 MHz. Efforts are underway to differentiate between density and magnetic fluctuations in the polarimetry measurement via cross correlation techniques and combined density measurements. This work supported by DOE contract DE-FG02-01ER54615 and DE-FC02-99ER54512-CMOD.

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