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Experimental Measurements of the Lower Hybrid Electric Field on Alcator C-Mod by Stark Effect Spectroscopy D. L. HILLIS, ORNL, R. MUMGAARD, PSFC MIT, C. LAU, ORNL, G. WALLACE, S. SHIRAIWA, PSFC MIT — A new diagnostic was installed on Alcator C-Mod capable of determining both the magnitude and direction of the lower hybrid wave electric field, $\mathbf{E_{LH}}$. The diagnostic, named SELHF (**S**tark **E**ffect **L**ower **H**ybrid **F**ield), simultaneously measures the two orthogonal polarization states of the D_β spectra by passive optical emission spectroscopy. The $\mathbf{E_{LH}}$ vector is then determined by systematically fitting the spectrum to the EZSSS (**E**xplicit **Z**eeman-**S**tark **S**pectra **S**imulator) code which incorporates a fully quantum mechanical model comprising of the appropriate dynamic electric field and magnetic field operators. The SELHF diagnostic has 27 unique views of the LH launcher and surrounding space, each integrating over a ˜3 cm in diameter sightline, which is comparable to the waveguide dimension. Two sightlines are simultaneously viewed, yielding four spectra per discharge. In this presentation the diagnostic setup will be given. The methodology behind the spectral modeling and the results of the associated error analysis, yielding the accuracy of the $\mathbf{E_{LH}}$ vector information, will be presented. The initial experimental results compared against a 2D cold-plasma model in COMSOL will be discussed. Work supported by DoE Contract No. DE-FC02-99ER54512 on Alcator C-Mod, a Department of Energy Office of Science user facility.

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