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Simulation and Analysis of ECCD Using the Motional Stark Effect Diagnostic on the DIII-D Tokamak[1] W.R. FOX, Princeton University, C.C. PETTY, Y.R. LIN-LIU, T.C. LUCE, H.E. ST. JOHN, General Atomics, M. MAKOWSKI, Lawrence Livermore National Laboratory — Electron cyclotron current drive (ECCD) can shape the plasma current profile by driving a localized current, which is desirable for improving the tokamak concept. Electron cyclotron waves drive current heat at the location where the propagating wavefronts intersect the second harmonic electron cyclotron frequency. Motional Stark effect (MSE) spectroscopy determines the ECCD-driven current profile with good spatial resolution by measuring changes in the magnetic field pitch angles. The relationship of the toroidal current density to the channel-to-channel differences in the measured pitch angles allows a determination of the ECCD location and relative magnitude; the time varying behavior of the MSE data similarly furnishes the toroidal electric field profile. Detailed analysis of the ECCD profile is achieved by comparing the measured pitch angles from MSE to simulations of the expected response using theoretical models of ECCD. The effect of the radial electric field on the MSE measurement has also been examined.

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☐ Prefer Oral Session
☒ Prefer Poster Session

Special instructions: Tuesday afternoon Undergraduate Research Session

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