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Advanced Tokamak Scenario Modeling Using Electron Cyclotron Current Drive in DIII-D[1] M. MURAKAMI, M.R. WADE, Oak Ridge National Laboratory, H.E. ST JOHN, J.C. DEBOO, T.S. TAYLOR, L.L. LAO, T.C. LUCE, R. PRATER, GA, T.A. CASPER, LLNL, and The DIII-D National Fusion Facility — The DIII-D Advanced Tokamak (AT) modeling work has focused on developing self-consistent, integrated high performance scenarios, and validating current drive (CD) and transport models, consistent with experimental results. Time dependent simulations based on experimentally determined transport coefficients from a target discharge ($B_t = 1.85\,\mathrm{T}$, $I_p = 1.2\,\mathrm{MA}$, and $n_e = 4.1\times10^{19}\,\mathrm{m}^{-3}$) are used to perform AT scenario modeling. These simulations indicate that appropriately distributed off-axis ($\rho = 0.35$, $\Delta_{FWHM} = 0.25$) electron cyclotron (EC) CD with 3.5 MW absorbed power can maintain the target discharge's negative central shear ($q_0 - q_{min} \approx 0.5$ with $q_{min} = 1.5$-2) for >10 s. Ranges of predictions due to ECCD/bootstrap current alignment and different transport models will be discussed.

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