

ANALYSIS OF ELECTRON CYCLOTRON CURRENT DRIVE EXPERIMENTS IN THE DIII-D TOKAMAK*

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Measurements of electron cyclotron current drive (ECCD) indicate good agreement of the magnitude of the driven current with Fokker-Plank predictions when the driven current is near the magnetic axis. When the driven current is moved farther off-axis, the measured current exceeds the predicted current by a significant amount. Additionally, in all cases, the measured current profile is broader than the theoretical prediction. Several potential sources for this broadening have been identified, including beam spreading, anomalous particle transport and finite resolution of the analysis technique. To test the analysis technique, simulations have been carried out comparing the predicted response of the motional Stark effect diagnostic signals for the theoretical current drive profile to the observed MSE signals. The spatial profile of the MSE response agrees with the measured signals indicating that the resolution of the analysis technique may be responsible. Further, the magnitude of the predicted MSE response verifies that current substantially in excess of the linear prediction is measured in the experiment. Comparisons of the measured and predicted deposition profiles will be shown.

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