

Abstract Submitted
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Feasibility Studies of Off-Axis Neutral Beam Current Drive in DIII-D¹ M. MURAKAMI, J.M. PARK, ORNL, T.C. LUCE, H.E. ST. JOHN, M.R. WADE, General Atomics, T.A. CASPER, LLNL — The objective of off-axis neutral beam (NB) current drive (CD) is to supplement the off-axis electron cyclotron current drive for development of steady state, advanced tokamak scenarios. A modification being considered is to tilt the present neutral beam lines (BL) by raising the source end of the BL by ≈ 1.5 m. The driven current is calculated using the TRANSP and ONETWO/Nubeam Monte-Carlo codes taking into account finite orbit effects. When the beam is injected in the same direction as the toroidal field, a wide but localized off-axis CD (≈ 40 kA/MW at $\rho = 0.5$ with FWHM of 0.45) is calculated. The normalized CD efficiency ($\zeta = 0.22$) is comparable or somewhat better than electron cyclotron current drive. Sensitivities to fast ion diffusion and the use of the off-axis CD for scenarios with high steady-state performance in DIII-D will be discussed.

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