

# Simulation of Neoclassical Tearing Modes in the DIII-D Tokamak

## Part II – Suppression by Radially Localized Electron Cyclotron Current Drive

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### Abstract

The problem of neoclassical tearing mode (NTM) suppression by a radially localized toroidal current from electron cyclotron current drive (ECCD) is considered. Simulation of NTM stabilization by ECCD is performed with the Nonlinear Fully Toroidal Code (NFTC) for DIII-D discharges. The optimal parameters are determined for the radially localized ECCD current required to reduce the NTM instability. The time response and nonlinear evolution of the magnetic island width

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for ECCD and the required modulation phasing, the current drive (CD) location with respect to the rational surface, and the width of the spatial distribution are determined for both monotonic  $q$ -profile and negative central shear discharges.