Complete Suppression of the m=2/n=1 NTM Using ECCD on DIII-D* C.C. Petty, R.J. La Haye, T.C. Luce, D.A. Humphreys, J. Lohr, R. Prater, *General Atomics,* R.W. Harvey, *CompX,* F.W. Perkins, *Princeton Plasma Physics Laboratory,* and M.R. Wade, *Oak Ridge National Laboratory*

The first suppression of the m=2/n=1 neoclassical tearing mode (NTM) is reported using electron cyclotron current drive (ECCD) to replace the "missing" bootstrap current in the island O-point. Previously on DIII-D, the physics of off-axis ECCD as modeled by the CQL3D quasi-linear Fokker-Planck code was verified. In an important application of ECCD, experiments on the DIII-D tokamak show that the maximum shrinkage of the m=2/n=1 island occurs when the ECCD location coincides with the q=2 surface. The DIII-D plasma control system is then put into "search and suppress" mode to make small changes in the toroidal field to find and lock onto the optimum position, based on real time measurements of dB_θ/dt, for complete m=2/n=1 NTM suppression by ECCD. The requirements on the ECCD for complete island suppression are well modeled by the modified Rutherford equation for the DIII-D plasma conditions.

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