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**Suppression of  $m = 2/n = 1$  Neoclassical Tearing Modes by Localized ECCD in DIII-D**<sup>1</sup> R. PRATER, R.J. LA HAYE, D.A. HUMPHREYS, J. LOHR, T.C. LUCE, C.C. PETTY, General Atomics — Neoclassical tearing modes can limit the performance of high beta discharges in DIII-D. The application of electron cyclotron current drive highly localized near the resonant surface of the mode can replace the missing bootstrap current and reduce or eliminate the island. This technique has been demonstrated on DIII-D and several other tokamaks for islands with toroidal helicity  $m = 3/n = 2$ . In DIII-D experiments, the more difficult  $2/1$  mode was fully suppressed for the first time anywhere using ECCD by applying 2.3 MW of power near the flux surface containing the islands. A “search and suppress” approach was used by the digital plasma control system to optimize the location of the ECCD while the NTM is present by adjusting the toroidal magnetic field. In these experiments, the neutral beam heating was reduced after the  $2/1$  mode developed in order to facilitate the stabilization by the ECCD, but this reduction could presumably be eliminated if the ECCD power were higher. Experiments planned for next year with more than 3 MW of ECCD power will test suppression of the  $2/1$  mode at beta values near the ideal no-wall limit.

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Prefer Oral Session  
Prefer Poster Session

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