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Highly Localized Electron Cyclotron Heating and Current Drive in DIII-D[1] R. PRATER, K.H. BURRELL, C.M. GREENFIELD, L.L. LAO, Y.R. LIN-LIU, J. LOHR, T.C. LUCE, C.C. PETTY, R.I. PINSKER, G.M. STAEBLER, General Atomics, M.E. AUSTIN, U. Texas, C. FUCHS, IPP Garching, R.W. HARVEY, CompX, J.E. KINSEY, Lehigh U., M.A. MAKOWSKI, LLNL, V. TRUKHIN, Kurchatov Institute, K.L. WONG, PPPL, DIII-D TEAM — Electron cyclotron heating (ECH) and current drive (ECCD) are widely recognized as methods of depositing highly localized power and current in a plasma based on calculations of wave absorption. Recent experiments using the 110 GHz ECH system at power levels above 1 MW demonstrate that ECCD can be as localized as theory predicts, through direct analysis of the poloidal field pitch angles measured by the motional Stark effect diagnostic. This very narrow profile of electron heating and current drive by EC waves can have dramatic effects on the plasma, creating high central electron temperatures even with very modest ECH power and generating a strong transport barrier in the electron fluid in discharges with reversed central magnetic shear.

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[X] Prefer Oral Session
[ ] Prefer Poster Session

Special instructions: 6th Oral presentation in DIII-D Session (to follow Lohr)

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