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**Feedback Control of Plasma Electron Temperature Using ECH on DIII-D**<sup>1</sup> M.R. WADE, M. MURAKAMI, Oak Ridge National Laboratory, J.R. FERRON, J. LOHR, T.C. LUCE, GA, M.E. AUSTIN, U. Texas — Feedback control of the plasma electron temperature  $T_e$  using either electron cyclotron heating (ECH) or neutral beam injection (NBI) has recently been demonstrated on DIII-D. Feedback control is accomplished via the DIII-D Plasma Control System (PCS), which in the case of ECH, dynamically controls in real time the power output of three ECH systems to reduce the difference between the electron temperature measured by an ECE radiometer and the requested value. The primary motivation for this tool is to increase the flexibility in obtaining optimized current profiles at the end of the current ramp by controlling the plasma resistivity directly, thereby de-coupling the current profile evolution from the NBI input power and plasma density. In this regard, experiments employing this technique have shown that nearly identical current density profiles are obtained for a given  $T_e$  request over a wide range of plasma densities and regardless of whether ECH or NBI feedback is used.

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