Abstract Submitted for the DPP11 Meeting of The American Physical Society

Effect of Resonant Magnetic Perturbations on Fluctuations and Transport on DIII-D¹ T.L. RHODES, L. ZENG, E.J. DOYLE, G. WANG, W.A. PEEBLES, L. SCHMITZ, J.C. HILLESHEIM, UCLA, S. MORDIJCK, The College of William & Mary, T.E. EVANS, GA, G.R. MCKEE, Z. YAN, U Wisc-Madison -Resonant magnetic perturbations (RMPs) have been shown to suppress ELM activity during H-mode and so is a very attractive (but not well understood) technology for ITER and future burning plasmas. In a series of experiments conducted on DIII-D, RMPs are found to significantly affect fluctuations, flow, transport, and resulting profiles on the DIII-D tokamak. Intermediate-k fluctuation levels $(1 \le k\rho_s \le 2)$, measured by Doppler backscattering) and poloidal flow can increase in magnitude $(\tilde{n}/n \text{ increases of } 20\%-30\% \text{ or larger})$ in the pedestal region during RMP. Linear growth rates from the trapped-gyro-Landau-fluid TGLF code indicate increased growth rates in this range of wavenumbers consistent with measurements. In addition, correlation electron cyclotron measurements of temperature fluctuations show a broadband increase during ELM suppressed RMP operation consistent with increased thermal transport.

¹Work supported by US DOE under DE-FG02-08ER54984, DE-FC02-04ER54698, DE- DE-FG02-07ER54917, DE-FG02-07ER54912, and DE-FC02-04ER54698.

Terry Rhodes University of California Los Angeles

Date submitted: 20 Jul 2011

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