Abstract Submitted for the 53rd Annual Meeting
Division of Plasma Physics
November 14-18, 2011, Salt Lake City, Utah

Category Number and Subject: 5.6.2. DIII-D Tokamak

[ ] Theory [X] Experiment [ ] Combined/General

Effects of Resonant Magnetic Field Perturbations on Density Profiles, Particle Transport, and Turbulence in DIII-D,* L. Zeng, E.J. Doyle, T.L. Rhodes, L. Schmitz, W.A. Peebles, *UCLA*; T.E. Evans, *GA*; S. Mordijck, *The College of William and Mary*; R.A Moyer, *UCSD*; G.R. McKee, Z. Yan, *U. Wisconsin-Madison* – First direct measurements of an increase in particle diffusivities and reduction in pinch velocities in DIII-D plasmas with applied resonant magnetic field perturbations (RMP) is presented for both L- and H-mode plasmas. Modulated gas puff combined with high-resolution profile reflectometry techniques are used and the results confirm particle transport enhancement with RMP. In H-mode, turbulence levels (measured by Doppler backscattering and BES) increase substantially with high I-coil current (> 4 kA) RMP, consistent with the observed changes in transport. Initial TGLF analysis indicates increased growth rates in this wavenumber range. Finally, observations that core density changes due to RMP can be minimized via adjusting I-coil current are presented.

*Work supported in part by US Department of Energy under DE-FG02-08ER54984, DE-FC02-04ER54698, DE-FG02-07ER54917, DE-FG02-89ER53296, DE-FG02-05ER54809 and DE-FG02-08ER54999.