

**Abstract Submitted for the Forty-Sixth Annual Meeting  
Division of Plasma Physics  
November 15–19, 2004, Savannah, GA**

Category Number and Subject:

Theory     Experiment

**ELM Suppression in DIII-D With Resonant Magnetic Preturbations,\*** T.E. Evans, *GA*, R.A. Moyer, *UCSD*, J.G. Watkins, *SNL*, G.L. Jackson, R.J. La Haye, T.H. Osborne, *GA*, P.R. Thomas, M. Becoulet, *CEA-Caderache*, J. Harris, *ANU*, M.E. Fenstermacher, M. Groth, C.J. Lasnier, *LLNL*– Type-I ELMs are suppressed in DIII-D with RMPs from a nonaxisymmetric coil without affecting the core confinement. Sometimes ELMs are converted into small oscillations punctuated by a few isolated ELM-like events and at others they are reduced in amplitude by an order of magnitude. Changing the toroidal phase of the RMP by 60 deg. produces an increase in the edge recycling and a flattening of the outer pedestal pressure profile along with a modest reduction in the ELM amplitude and frequency. Modeling studies with the TRIP3D field line integration code [1] combined with experimental results suggest that two types of mechanisms are involved. In one case, the RMPs induce small coherent islands across the pedestal that may break-up long wave structures and inhibit ELM triggers. In the other case, a stochastic layer flattens the pressure profile just below the ballooning-peeling limit and slows the reheat time between ELMs. Examples of each type of suppression will be shown and modeling calculations of the two suppression mechanisms will be discussed.

[1] T.E. Evans, et al., *Phys. Plasmas* **9**, 4957 (2002).

\*Work supported by U.S. DOE under DE-FC02-04ER54698, DE-FG02-04ER54578, DE-AC04-94AL85000, and W-7405-ENG-48.