

**Abstract Submitted for the Fiftieth Annual Meeting
Division of Plasma Physics
November 17th-November 21st, 2008, Dallas, Texas, USA**

Category Number and Subject: DIII-D

Theory Experiment

Spectral Effects on Plasma Performance in ITER Similar DIII-D RMP H-modes,* T.E. Evans, N.H. Brooks, M.J. Schaffer, GA, E.A. Unterberg, *ORISE*, M.E. Fenstermacher, C.J. Lasnier, *LLNL*, H. Frerichs, O. Schmitz, B. Unterberg, *FZJ*, M.W. Jakubowski, *MPI*, S. Mordijck, R.A. Moyer, *UCSD*, J.G. Watkins, *SNL* – A significant expansion of the resonant magnetic perturbation (RMP) H-mode operating space has been obtained by combining perturbations from the DIII-D I- and C-coil sets. Using the combined n=3 and n=1 perturbations of these two coil sets, ELM suppression has been obtained over an extended range of shapes, collisionalities, NBI power and torque levels, toroidal rotation levels, densities and edge safety factor profiles including those relevant to ITER. Combined with new RMP spectral analysis and modeling techniques, this capability has resulted in an improved understanding of RMP physics and provides a stronger basis with which to predict how RMP ELM control will scale to ITER conditions. Experimental data and modeling results will be presented that demonstrate how combined n=3 and n=1 perturbations of the RMP coils can be used to expand the ELM suppression operating space in ITER similar DIII-D plasmas.

*Supported by US DOE under DE-FC02-04ER54698, DE-AC05-06OR23100, DE-AC52-07NA27344, and DE-AC04-94AL85000.