

**Abstract Submitted for the 52nd Annual Meeting
Division of Plasma Physics
November 8–12, 2010, Chicago, Illinois**

Category Number and Subject:

Theory Experiment

Turbulence Studies at the Top of the Pedestal,* S.P. Smith, R.J. Groebner, G.M. Staebler, J.R. Ferron, *General Atomics* — The confinement of tokamak plasmas dramatically improves during a high performance mode of operation (H-mode). An H-mode plasma typically has steep temperature and density gradients (a barrier) near the edge of the plasma, but the question remains as to what limits the gradients in the H-mode barrier. Two possibilities are electron temperature gradient (ETG) and kinetic ballooning mode (KBM) turbulence. A key parameter that drives the ETG mode is η_e , the ratio of the electron density scale length to the electron temperature scale length. It is shown that qualitative changes in η_e at the top of the pedestal correlate in time with the occurrence of ELM-free phases in some high- β DIII-D discharges. The effect this change in η_e has on turbulent fluxes is presented.

*Supported by the US Department of Energy under DE-FC02-04ER54698.