

**Abstract Submitted for the 54th Annual Meeting
Division of Plasma Physics
October 29 through November 2, 2012
Providence, Rhode Island**

Category Number and Subject: 5.6.2. DIII-D Tokamak

Theory Experiment

Latest Results on Resonant Magnetic Perturbation (RMP) Induced ELM Suppression on DIII-D,* R. Nazikian for the RMP ELM Suppression Task Force, *Princeton Plasma Physics Laboratory* – Recent experiments on DIII-D have revealed new insights into the suppression of Edge Localized Modes (ELMs) by RMPs. A leading hypothesis for ELM suppression is that resonant fields open up islands at the top of the H-mode pedestal where the perpendicular electron velocity V_e is small. These islands enhance transport, flatten the pressure profile and restrict the width of the pedestal sufficient to suppress the Peeling-Ballooning mode. Experiments with strong counter rotating plasmas maintained large V_e across the plasma profile and RMP ELM suppression was not observed, consistent with the model. X-ray imaging measurements reveal structure inside the last closed flux surface that may indicate the presence of islands in ELM suppressed plasmas. A new lower limit for n=3 RMP ELM suppression of 1.3 kA in the I-coils provides a strong test of the requirement for ELM suppression based island and stochastic field line models. Rapid modulation of the RMP amplitude reveals a prompt response of the turbulence on the time scale of the E_r change, indicative of turbulent transport modification as a precursor to the pressure profile evolution and ELM suppression. Experiments to open up additional q95 windows of ELM suppression will be discussed.

*Work supported by the US Department of Energy under DE-AC02-04CH11466 and DE-FC02-04ER54698.