Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Spatial decoupling of the n = 1 plasma response during $n = 2$ RMP ELM suppression on DIII-D[1] J.D. KING, E.J. STRAIT, R.J. BUTTERY, R.J. LA HAYE, C. PAZ-SOLDAN, GA, R. NAZIKIAN, PPPL — Experiments in the DIII-D tokamak show a strong $n = 1$ mode appears when edge localized modes (ELM) are suppressed via an applied $n = 2$ resonant magnetic perturbation (RMP). The poloidal structure of this $n = 1$ mode, as it unlocks from the vacuum vessel wall, is discussed. An $n = 2$ mode is found to be entrained by the rotating RMP and an estimate of the modes m is presented. Previous work suggests these $n = 1$, 2 modes are magnetic island structures located at the top of the H-mode pedestal.[2] The width of these islands is estimated to be $2 \sim 3$ cm and the calculated confinement degradation due to their presence is $8 \sim 12\%$, which is close to the $13 \sim 14\%$ measured between the ELMing and RMP suppressed states. This suggests island energy transport may be sufficient to explain the change in peeling-ballooning stability during RMP induced ELM suppression.

[1]Work supported by the US Department of Energy under, DE-FC02-04ER54698, DE-AC02-09CH11466.
[2]R. Nazikian et al., Phys. Rev. Lett., 114, 105002 2015.

J.D. King
General Atomics

Date submitted: 21 Jul 2015 Electronic form version 1.4