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☐ Theory ☒ Experiment

ELM Size and $v_{\perp,e}=0$ Location During RMP H-mode Plasmas in DIII-D,* M.E. Fenstermacher, *LLNL*, R.A. Moyer, *UCSD*, T.H Osborne, *GA* — Previous studies [1,2] examined the correlation between vacuum island overlap region width and edge localized mode (ELM) size during $n=3$ resonant magnetic perturbations (RMPs) in DIII-D. For rotating H-mode plasmas it was proposed [3,4] that the resonant perturbation components would be screened by plasma response except at locations with the sum of the electron diamagnetic and ExB velocities, $v_{\perp,e}=0$. One hypothesis for the mechanism of RMP ELM suppression is that the pedestal width is prevented from expanding to the peeling-ballooning instability boundary by plasma modes at a location where vacuum RMP fields penetrate. This would suggest that the $v_{\perp,e}=0$ location would be closer to the plasma edge during ELM suppression than during ELM mitigation. This paper will examine the degree of correlation between $v_{\perp,e}=0$ location and ELM size during RMP H-mode plasmas including those from the previous studies.

- [1] M.E. Fenstermacher *et al.*, Phys Plasmas **15** (2008) 056122.
- [2] M.E. Fenstermacher *et al.*, J. Nucl. Mater. **390** (2009) 793.
- [3] M. Heyn, *et al.*, Nucl. Fusion **48** (2008) 024005.
- [4] E. Nardon, *et al.*, Nucl. Fusion **50** (2010) 034002.

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