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[**x**] Theory [x] Experiment

RMP Effects on Pedestal Structure and ELMs,* J.D. Callen, A.J. Cole, C.C. Hegna, *U. Wisc.*; S. Mordijck, *William and Mary*; R.A. Moyer, *UCSD* – Plasma toroidal rotation can prevent reconnection of resonant magnetic perturbation (RMP) fields on rational surfaces and hence magnetic island formation and stochasticity. However, the magnetic flutter induced by RMP fields off the rational surfaces induces a radial electron heat diffusivity $\chi_e^{RMP} \sim \left(\delta B^2 / B_p B_T\right)\chi_l$ in which $\chi_l \propto v_{Te}^2/\nu_e$ is an effective parallel electron heat diffusivity. The flutter also diffuses electrons radially and causes a factor of about 30 smaller increases in density diffusion, the radial electric field and plasma toroidal rotation. Model effects that may correlate with low collisionality DIII-D RMP experimental data [1] in the pedestal top region include q_{95} resonance windows, importance of bootstrap current in reducing magnetic shear there, and effects of increasing the I-coil current ($\propto \delta B$): broadening of the resonance window, progressively stronger reductions in the T_e gradient that may stabilize peeling-ballooning instabilities and thereby prevent ELMs, smaller density gradient reductions and slight increases in the radial electric field and plasma toroidal rotation.

[1] T.E. Evans, et al., Nucl. Fusion **48**, 024002 (2008).

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