Roles of RMP-induced Changes of Radial Electric Fields in ELM Suppression

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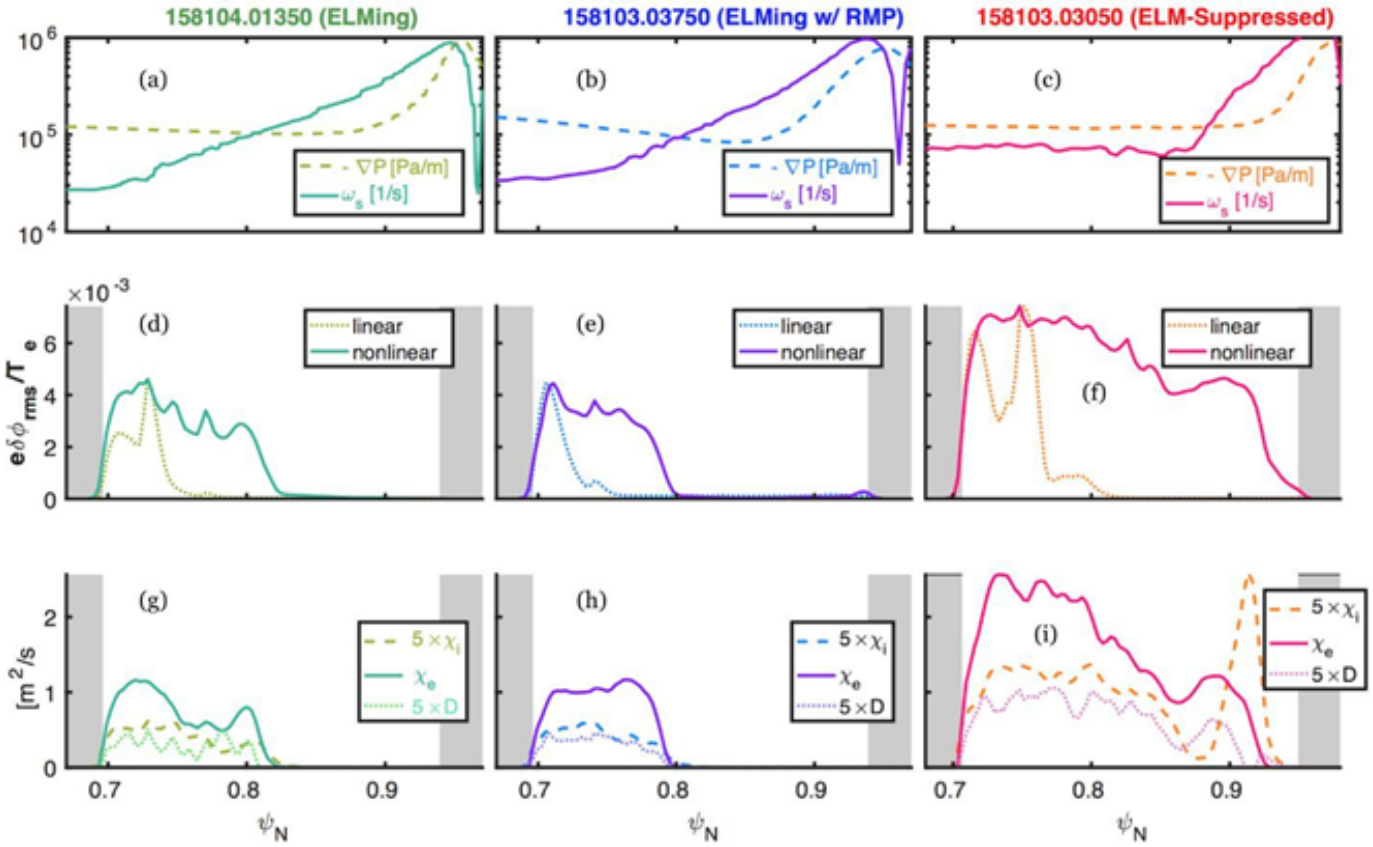
- Gyrokinetic GTC simulations show that reduction in radial electric field shear (ω_s, *upper panels*) at pedestal top during edge localized mode (ELM) suppression (*right column*) with n = 2 resonant magnetic perturbations (RMP) in DIII-D leads to enhanced microturbulence ($\delta\phi$, *middle panels*) and extended turbulence spreading to pedestal top relative to ELMing (*middle column*) plasmas with similar RMP or without RMP *(left column)*.
- Simulated turbulence and transport (D/χ, *lower panels*) is consistent with experimental observations of enhanced turbulence at pedestal top during ELM suppression by RMP, suggesting that enhanced microturbulence due to reduced ExB shear at pedestal top can contribute to additional transport required to prevent pedestal width growing to excite ELM.



- GTC simulations of neoclassical transport show that electron flutter motion due to RMP islands introduces a radial particle flux that is not strong enough to directly provide measured enhancement in transport, but may contribute to observed change in radial electric field due to ambipolar potential.