





Experimental conditions for suppressing ELMs by magnetic perturbations in ASDEX Upgrade

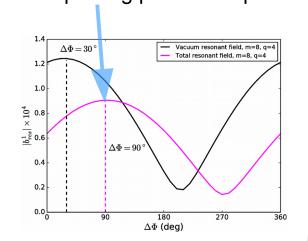


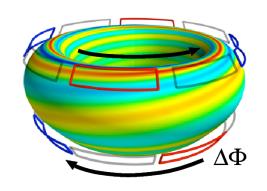


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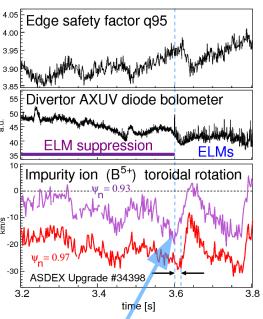
1. Magnetic perturbation: n=2, $\Delta\Phi_{ul}$ for maximum kink-peeling plasma response





2. Safety factor in window: q95 = 3.57 .. 3.95 (more windows possible

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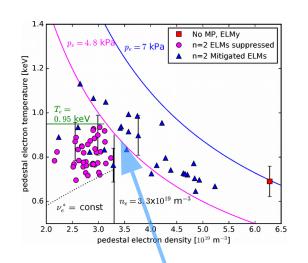


Sharp back-transition,

- initiated as rotation changes inside the pedestal knee
- propagates out

3. Low edge density

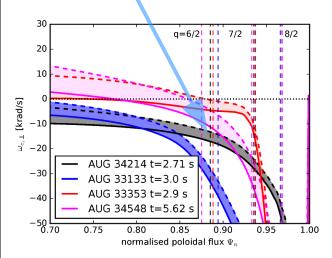
< 3.3x10¹⁹ m⁻³ (not clear if a collisionality limit)



Mitigated ELMs decorate a pedestal pressure limit

- ELM suppression occurs at lower pedestal pressure
- → Confinement improvement requires increased pedestal stability

4. No rotation threshold – ELM suppression found also if $\omega_{e^-} \neq 0$ at pedestal top



 $\omega_{\text{\tiny ExB}}$ = 0 at the pedestal top

→ ELM suppression may be due to a resistive response, <u>if</u> kinetic effects destroy shielding of magnetic perturbation