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:
   \[ q_{95} = 3.57 \ldots 3.95 \] (more windows possible but not yet explored)

3. Low edge density:
   \[ < 3.3 \times 10^{19} \text{ m}^{-3} \] (not clear if a collisionality limit)

4. No rotation threshold – ELM suppression found also if \( \omega_{e\perp} \neq 0 \) at pedestal top
   \( \omega_{\text{ExB}} = 0 \) at the pedestal top
   → ELM suppression may be due to a resistive response, if kinetic effects destroy shielding of magnetic perturbation

Mitigated ELMs decorate a pedestal pressure limit
- ELM suppression occurs at lower pedestal pressure
→ Confinement improvement requires increased pedestal stability