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Theory Experiment

An overview of recent DIII-D ELM control experiments*

T.E. Evans, *GA*; and the DIII-D ELM Control for ITER Working Group — Recent ELM control experiments in DIII-D have focused on expanding our understanding of urgent ITER physics issues. Results from these experiments are contributing to an integrated ITER ELM control program involving both ELM suppression and mitigation using resonant magnetic perturbation (RMP) fields and pellet pacing. For example, RMPs applied before the H-mode transition with $q_{95}=3.5$, the ELM suppression operating point, increase in the L-H power threshold by 40% while no significant effects are seen when operating above the ELM suppression resonant window at $q_{95}=4.1$. Peak energy transients on the divertors, due to RMP mitigated ELMs, are reduced by a factor of 8 compared to typical type-I ELMs when operating outside the resonant ELM suppression window. Deuterium fueling pellets injected from the high-field side of the discharge sometimes trigger ELMs while those injected from the low-field side do not. Suppression of the first ELM after the H-mode transition is obtained by controlling the density rise during the initial H-mode ELM free period. An overview of our recent results is presented.

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