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Study of the Relationship between Type I ELM Severity and Perturbed Electron Transport in NSTX[1] KEVIN TRITZ, D. STUTMAN, L. DELGADO-APARICIO, M. FINKENTHAL, The Johns Hopkins University, R. BELL, B. LEBLANC, S. KAYE, Princeton Plasma Physics Laboratory, R. MAINGI, Oak Ridge National Laboratory, S. SABBAGH, Columbia University, THE NSTX TEAM — Global T_e profile crashes of 10-30% amplitude are observed following large Type I ELMs in some H-mode NSTX discharges. While the soft X-ray (SXR) data indicates that the ELM itself is causing only a peripheral T_e perturbation, the propagation of the cold pulse initiated by the ELM is anomalously fast ($\sim$ms timescale) and can extend to the core of the plasma. The estimated perturbed χ_e is a few hundred m^2/s for $\rho > 0.4$, and a few tens of m^2/s for $\rho < 0.4$. This behavior suggests a link between the severity of Type I ELMs and the perturbed electron thermal transport on NSTX. We produced controlled perturbations at the plasma edge by injecting small low-Z pellets into ELMy H-mode plasmas, and compared the ELM and pellet induced cold pulse using multi-color SXR imaging. In plasmas with large Type I ELMs the pellet perturbation has a similarly large effect on the global T_e profile. In recently developed high triangularity regimes with smaller ELM perturbations, the pellet induced perturbations are likewise reduced.

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