

Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Analysis of pellet induced perturbations in NSTX using soft X-ray techniques D. STUTMAN, K. TRITZ, L. DELGADO-APARICIO, M. FINKENTHAL, Johns Hopkins University, R. BELL, R. KAITA, S. KAYE, H. KUGEL, B. LEBLANC, L. ROQUEMORE, E. SYNAKOWSKI, Princeton University, F. LEVINTON, Nova Photonics, S. SABBAGH, Columbia University, NSTX TEAM — A ‘multi-color’ soft X-ray technique is being developed for perturbative transport studies on NSTX. The plasma is simultaneously viewed by soft X-ray arrays in different energy bands and modeling of the emission profiles used to propagate on fast time scale (<0.1 ms) the T_e profile measured by laser scattering. Applied to Type-I ELM perturbations the technique shows good accuracy over tens of ms. The perturbed T_e profile indicates fast ‘cold pulse’ propagation in the outer plasma, with a marked slow down towards the axis. The incremental electron heat diffusivity has radial dependence quite opposite to that obtained from the power balance. The technique is further applied to perturbations produced by Li pellet injection. The pellet induced emission is recorded in three spectral ranges, with the range >0.1 keV providing an image of the pellet penetration, estimated to arise from C lines excited by charge exchange with Li neutrals. The higher energy profiles are used to estimate the T_e and the electron times impurity density perturbation. The capabilities of this technique and initial results from pellet perturbative experiments will be discussed. Work supported by US DoE grant DE-FG02-99ER5452 at JHU

Dan Stutman
Johns Hopkins University

Date submitted: 24 Aug 2005

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