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Characterization of inter-ELM impurity transport following 3D-field-triggered ELMs in NSTX[1] FILIPPO SCOTTI, V.A. SOUKHANOVSKII, LLNL, R.E. BELL, PPPL, J.M. CANIK, ORNL, A. DIALLO, B.P. LEBLANC, M. PODESTA', PPPL — The response of electron temperature and density profiles to edge localized modes (ELMs) triggered by 3D fields and the inter-ELM impurity transport are studied in NSTX H-mode discharges. 3D magnetic perturbations (n =3) were used in lithium-conditioned ELM-free H-mode discharges to trigger ELMs (f_{ELM} =10-62.5 Hz) and mitigate core impurity buildup [Canik PRL 2010]. For 10 Hz triggering, impurity flushing was observed for ψ_N>0.5 following the ELM crash, with up to a 30% drop in carbon density at the pedestal top and comparable effects on the T_e, n_e, T_i, v_Φ profiles. The increase in the triggered ELM frequency progressively reduced the total carbon inventory, affecting profiles at inner radii. Carbon transport during and following the ELM crash is modeled using the impurity transport code MIST. Transient perturbations to the steady state particle diffusivity D and convective velocity v are applied to simulate the effect of the ELM on the carbon density evolution. An inward (convective) transport perturbation for ψ_N <0.5 and an outward (diffusive and/or convective) transport perturbation for ψ_N >0.5 are needed to reproduce the carbon density profile temporal evolution. While the equilibrium v/D ratio is inferred from the steady state carbon density profiles, the profile recovery following the ELM crash is used to estimate absolute values of the transport coefficients.

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