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Study of C and Li neoclassical transport in NSTX Li-conditioned ELM-free H-mode discharges F. SCOTTI, PPPL, V.A. SOUKHANOVSKII, LLNL, S. KAYE, R. ANDRE, S. GERHARDT, R.E. BELL, A. DIALLO, B.P. LEBLANC, M. PODESTÀ, PPPL, S.A. SABBAGH, Columbia University, H.W. KUGEL, R. KAITA, M.G. BELL, PPPL — ELM-free H-mode discharges are routinely achieved with lithium wall conditioning in NSTX, with a concomitant core impurity accumulation. Z_{eff} generally increases up to 4-5 (due to C) and core P_{rad} ramps up to several MWs (due to metals). In contrast, Li is efficiently screened from the core, where it is present at about 1% of C densities. C and Li density profiles show similar time evolutions, with the early formation of a higher density “ear” and a slower diffusion to the core. In this work, the neoclassical transport code NCLASS is used to study neoclassical multi-ion transport in NSTX plasmas. In particular, possible effects leading to a change in C transport due to Li conditioning are analyzed in discharges with and without applied Li coatings; these include the presence of a low Z collisional background ion (Li) and changes in the D ion temperature and density profiles. Neoclassical predictions are tested with the MIST impurity transport code to check consistency with experimentally measured core impurity density profiles. Work supported by U.S. DOE Contracts DE-AC02-09CH11466 and DE-AC52-07NA27344.

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