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Study of neoclassical effects on the pedestal structure in ELMy H-mode plasmas A.Y. PANKIN, G. BATEMAN, A.H. KRITZ, T. RAFIQ, Lehigh U., G.Y. PARK, S. KU, C.S. CHANG, NYU Courant Institute, P.B. SNYDER, General Atomics — The neoclassical effects on the H-mode pedestal structure are investigated in this study. First principles' kinetic simulations of the neoclassical pedestal dynamics are combined with the MHD stability conditions for triggering ELM crashes that limit the pedestal width and height in H-mode plasmas. The neoclassical kinetic XGC0 code [1] is used to produce systematic scans over plasma parameters including plasma current, elongation, and triangularity. As plasma profiles evolve, the MHD stability limits of these profiles are analyzed with the ideal MHD stability ELITE code [2]. The scalings of the pedestal width and height are presented as a function of the scanned plasma parameters. Simulations with the XGC0 code, which include coupled ion-electron dynamics, yield predictions for both ion and electron pedestal profiles. Differences in the electron and ion pedestal scalings are investigated.

[1] C.S. Chang et al, Phys. Plasmas 11 (2004) 2649.

[2] P.B. Snyder et al, Phys. Plasmas, 9 (2002) 2037.

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