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Simulation of convective cross-field transport, toroidal plasma flows, and dust dynamics in NSTX with UEDGE and DUSTT codes. A.YU. PIGAROV, S. KRASHENINNIKOV, J. BOEDO, UCSD, R. BELL, S. PAUL, A. ROQUEMORE, PPPL, V. SOUKHANOVSKII, PPPL, R. MAINGI, C. BUSH, ORNL, T. SOBOLEVA, UNAM — Fast intermittent convective cross-field transport has been observed in the outer SOL of NSTX and other tokamaks. It is expected that such kind of transport has ballooning like asymmetry and can be a cause of large parallel plasma flows in SOL. With UEDGE code, we perform multi-species fluid simulations in the LSN magnetic configuration of NSTX L-mode plasma using poloidally asymmetric profiles for anomalous transport coefficients and convective velocities and for some boundary conditions on the chamber wall. We present modeling results on SOL plasma flows originating from outer mid-plane, moving into inner divertor, and reaching M$\sim$1 at inner mid-plane. The UEDGE analysis of experimental NSTX data with newly developed 3D diagnostic tools (e.g. for bolometry) will be given. Also, as measured, dust particulates of micron size are unavoidably present in NSTX. We present results on simulation of dust dynamics, transport, and ablation with DUSTT code. The possible effect of dust on NSTX divertor plasma profiles is discussed. The research was supported by DoE Grants NRG5025 and DE-FG02-04ER54739 at UCSD.

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