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Validation of BOUT++ ELM simulations for the EAST Tokamak discharges ZIXI LIU, Institute of Plasma Physics, Chinese Academy of Sciences, XUEQIAO XU, Lawrence Livermore National Laboratory, Livermore, XIANG GAO, SHAOCHENG LIU, TIANYANG XIA, GUOSHENG XU, JIANGGANG LI, Institute of Plasma Physics, Chinese Academy of Sciences, EAST TEAM — EAST ELM experiments validate BOUT++ predictions that low-n modes become dominant at high plasma current, and the bright stripes from visible camera on EAST match ELM filamentary structures of BOUT++ simulations. Four phases of the ELM dynamics including linear growth, nonlinear saturation, pedestal crash, and L-mode-like post-ELM state have been observed in BOUT++ simulations. The simulated radial velocity of ELM explosive event is consistent with the experimental data by Gas Puffing Image (GPI). Energy loss is about 2 percent; more particle and power fluxes are deposited on the outer divertor plate. The small ELMs on EAST are resistive ballooning modes, and higher plasma current and the pressure result in higher growth rate for the lower toroidal numbers. Effect of the diamagnetic drift is stronger than the ballooning instability drive when the pressure gradient increases and the ELM crashes start at the outer mid-plane.

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