Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Simulations of ELM sizes and heat fluxes in an ELMy H-mode discharge on HL-2A[1] XIAOXUE HE, Dalian University of Technology, Lawrence Livermore National Laboratory, TIANYANG XIA, Institute of Plasma Physics, Chinese Academy of Sciences, YUE LIU, Dalian University of Technology, XUEQIAO XU, Lawrence Livermore National Laboratory — As we know that the equilibrium profiles have directly impact on ELM size and heat fluxes. In this work we take seven profiles trying to find out the influence of the pedestal profiles on the ELM size and electron heat flux to the outer target. The equilibrium profiles from the ELMy H-mode HL-2A discharge # 24953 are adopted as the initial condition in the original case, and six more equilibriums are constructed upon the original case to scan the pedestal height and position. The BOUT++ six-field two-fluid model is used to reproduce the peak of the electron heat flux to the outer divertor target during the ELM bursts. Results indicate that the ELM size increases with the higher pedestal for the larger pressure gradient, and it decreases because the enhancement of the local magnetic shear suppresses the curvature driving term when the pedestal is closer to the last closed flux surface. And the heat flux increases in both processes. Furthermore, theoretical analysis and the simulation results consistently present the heat flux $q_{\|e}$ is proportional to $n_{e0}T_{e0}^{\frac{3}{2}}$, which means that the heat flux is a fixed value as long as the term $n_{e0}T_{e0}^{\frac{3}{2}}$ remain unchanged.

[1]This work was performed for USDOE by LLNL under DE-AC52-07NA27344 and also was supported by National Key RD Program of China under Grant No. 2018YFE0303100, 2018YFE0303102.

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Date submitted: 03 Jul 2019 Electronic form version 1.4