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Fast electron effects on plasma-wall interactions on EAST tokamak

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It is shown that fast electrons can be produced in the scrape-off-layer(SOL) of EAST during lower hybrid current drive experiments, which may modify the magnetic topology and contribute to hotspots on divertor targets [1][2]. In this work, the interactions between electrons and launched lower hybrid waves are investigated via particle-in-cell simulations and the fast electron effects on the heat flux to divertor targets are discussed. It is found that the sheath potential drop near the target is significantly raised due to the presence of fast electrons. As a result, both ion and electron heat fluxes to the limiters are strongly enhanced compared to those in a Maxwellian plasma. With the enhancement of the sheath potential drop, the physical sputtering yield of tungsten and carbon on EAST divertor target surfaces is obtained and the dependence on the plasma parameters and input power is discussed.

References

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Figure xx

Note: Abstract should be in 1 page.