

Abstract Submitted
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Non-thermal plasmas in fusion tokamak edge C.S. CHANG, Princeton Plasma Physics Laboratory — Nonthermal plasma is an important part of the tokamak edge physics, if not dominant, and makes the fluid or thermal equilibrium physics to be limited. The non-thermal plasma in the edge region is generated by plasma loss along open magnetic field lines, wall-recycled neutral particles, sputtered impurity particles, orbit loss cone in the velocity space and strong plasma turbulence. They affect the edge plasma confinement through modification of electric field, parallel heat loss, plasma flow, and turbulence transport. Various generation mechanisms of the non-thermal plasmas, their dynamics, and their effect on the plasma transport will be discussed in detail using simulation results from the plasma kinetic code XGC in realistic diverted edge geometry.

C.S. Chang
Princeton Plasma Physics Laboratory

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