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ELECTRON DIFFUSION IN A SHEARED UNPERTURBED MAGNETIC FIELD AND A RELATIVELY HIGH ELECTROSTATIC TURBULENCE

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Abstract

The electron diffusion induced by a two-dimensional electrostatic turbulence, in a sheared slab approximation of the toroidal magnetic geometry, is studied using the decorrelation trajectory method (DCT). This method, that permits to go beyond the Corrsin approximation, also allows a non classical analysis of the particle trapping phenomenon. The "radial" and the "poloidal" running and asymptotic diffusion coefficients of thermal electrons are obtained for physically accessible parameter values corresponding to a relatively strong electrostatic turbulence. The existence of enhanced diffusion in the poloidal direction is observed in presence of the magnetic shear.