Poloidal particle flux in a turbulent non-ohmic plasma in leading order approximation for passing particles

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Abstract

The poloidal component of the ion particle flux in a turbulent magnetically confined plasma submitted to an external rf heating is obtained analytically in terms of the thermodynamic forces and of correlations of fluctuating scalar and vector potential which define fluctuating electromagnetic field. We consider here only the contribution given by particles in passing regime. The various contributions to this flux are derived using the methodology of neoclassical transport theory i.e. the standard model of magnetic field and cyclotron resonance heating since we are interested in synergetic efects in non-ohmic plasma.