Estimation of drift fluctuation under the action of shear flow

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In this work, the processes of drift turbulent suppression was studied under conditions of the L-H transition in transport barrier. Main idea of the probable decreasing of drift fluctuations was recently observed [1]. The essence contains that the arising shear flow lead to a strong distortion of unstable ion temperature-gradient (ITG) drift wave. This is a cause that prevents the development of large disturbances. The influence of plasma parameters (density, temperature, their gradients, etc.) on the fluctuations is taken into account. The numerical results for the parameters of drift modes [2, 3] are used.

The following results are based on the nonlinear analysis of finite amplitude drift wave dynamics. Firstly, the magnitude of the density and temperature perturbations were estimated taking into account the dependence of linear growth rate of drift wave and flow velocity shear. Secondary, the influence of local hydrodynamic quantities (density, temperature, and their gradients, etc.) on the linear growth rate and amplitudes was studied. Estimations of drift fluctuations are based on data about radial density and temperature profiles and velocity shear. The results are in good agreement with experimental data [4].

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References

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