

Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Trajectory trapping and structure generation in turbulent magnetized plasmas MADALINA OLIMPIA VLAD, FLORIN SPINEANU, National Institute of Laser, Plasma and Radiation Physics — The ExB drift determines a trapping effect or eddy motion in turbulence with slow time variation. We have shown using a semi-analytical approach that this nonlinear process generates non-standard statistical behavior of the trajectories: memory effects and non-Gaussian probability. The trapped trajectories have quasi-coherent behavior and they form structures similar to fluid vortices. We analyze here the effects of this non-standard statistics of trajectories on the evolution of the drift turbulence in Vlasov description. We consider test modes on turbulent plasma with given statistical characteristics and show that trajectory structures determine the evolution of the drift turbulence toward large scales (inverse cascade). The initial value problem of the drift turbulence is studied. The conclusion is that the main mechanism determining the non-linear evolution of the turbulence toward ordered flow is the trapping and dragging of a part of ions by the potential that moves with the diamagnetic velocity accompanied by the opposite direction average motion of the other ions.

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Date submitted: 21 Jul 2007

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