Influence of the large-scale zonal flows and magnetic fields on the relative short-scale ULF electromagnetic waves in the ionosphere with shear flow

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Influence of the large-scale zonal flows and magnetic fields on the relative short-scale ULF electromagnetic waves in the dissipative ionosphere in the presence of a smooth inhomogeneous zonal wind (shear flow) is studied. A broad spectrum of Alfvenic-like electromagnetic fluctuations appears from electromagnetic drift turbulence and evidence of the existence of magnetic fluctuations in the shear flow region is shown in the experiments. In present work one possible theoretical explanation of the generation of electromagnetic fluctuations in DW-ZF systems is given. We show that the transient growth substantially exceeds the growth of the classical dissipative trapped-particle instability of the system. Excitation of electromagnetic fluctuations in such systems leads to the Attenuation-suppression of the short-scale turbulence.

Also the numerical treatment of the satellite data is carried out. Influence of Bursty Bulk Flow (BBF) on the ionospheric plasma is investigated. It is shown, that it causes essential thinning of the plasma sheet at developing stage during passage inside it, but at the recovery stage plasma sheet thickening occurs and its size exceeds much the initial one.