



Characterization of turbulent plasma fluctuations inside dipolarizing flux bundles in the Earth's magnetotail

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The features of turbulent processes has been analyzed, and spectra of the turbulence have been obtained for the regions of the dipolarization of the magnetic field in the Earth's magnetosphere tail from the measurements of four Cluster-2 mission spacecraft (4-th events 2014 - 2015). The spectral and wavelet analysis were supplemented by investigations of fluctuation kurtosis for plasma parameters. In the region of dipolarization of magnetic field in the magnetosphere tail we have detected: kurtosis change; the break in the spectra on frequencies lower than proton gyrofrequency; changing a character of turbulent motions on different time scales (on large time-scales the turbulent flows are close to the homogeneous models, and at smaller time scales the spectral indexes are correspond to the Hall-MHD model); the presence of powerful Pc5 and Pc4 pulsations, and also direct and inverse cascades.

Moreover, in our study we set out to establish validity of the dispersion relation concept to the magnetic field turbulent fluctuations in the Earth's magnetotail. For this purpose, fast method of directly determination of the dispersion relation from multipoint measurements, namely, the wave survey method was used. This technique allows identifying a single dominant wave mode for scalar or vector data, not limited to a certain number of sensors.

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