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Statistical analysis of plasma turbulence

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Investigation of statistical features of the magnetic field fluctuations in different regions of Earth magnetosphere and the solar wind plasma at different time scales from satellite Interball data has been carried out. Changes of shape and parameters of the probability distribution function for periods of the satellite position in different magnetosphere regions were examined. As a characteristic of evolution at different time scales the changes of probability of return P (0) and kurtosis values were used.
Two asymptotic modes for P (0) characterized by different power lows have been found. In addition, for the analysis of turbulent processes the structure functions of different orders were investigated, and comparison of the obtained results with log-Poisson cascade model and Iroshnikov-Kraichnan model was made.
We discuss time scalings of generalized diffusion coefficient in terms of superdiffusion and classical diffusion.