



Investigation of the variance and spectral anisotropies of the solar wind turbulence with multiple point spacecraft observations

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One of the most important features of the plasma turbulence is the anisotropy, which arises due to the presence of the magnetic field. The understanding of the anisotropy is particularly important to reveal how the turbulent cascade operates. It is well known that anisotropy exists with respect to the mean magnetic field, however recent theoretical studies suggested anisotropy with respect to the radial direction.

The purpose of this study is to investigate the variance and spectral anisotropies of the solar wind turbulence with multiple point spacecraft observations. The study includes the Advanced Composition Analyzer (ACE), WIND and Cluster spacecraft data. The second order structure functions are derived for two different spacecraft configurations: when the pair of spacecraft are separated radially (with respect to the spacecraft -Sun line) and when they are separated along the transverse direction. We analyze the effect of the different sampling directions on the variance anisotropy, global spectral anisotropy, local 3D spectral anisotropy and discuss the implications for our understanding of solar wind turbulence.