

CORRELATION FUNCTIONS OF SMALL-SCALE FLUCTUATIONS OF THE INTERPLANETARY MAGNETIC FIELD

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The Interplanetary Magnetic Field shows complex spatial and temporal variations. Single spacecraft measurements only reveal a one dimensional section of this rich four dimensional phenomenon. Multi-point measurements of the four Cluster spacecraft provide a unique tool to study the spatiotemporal structure of the field. Using these data we determined three dimensional correlation functions of the fluctuations. The correlation function is an important tool to describe and measure field variations. Our results can be used to verify theoretical predictions. We found that the correlation length varies over almost six orders of magnitude. The IMF turbulence shows significant anisotropy with two distinct populations. In certain time intervals the ratio of the three axes of the correlation ellipse is $1/2.2/5$ while in the remaining time it is roughly $1/2/150$. We found favored directions in the orientation of the correlation ellipse.

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