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Magnetic Fluctuations in the Terrestrial Magnetosheath

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Abstract : The terrestrial magnetosheath is a highly turbulent medium, with a high level of magnetic1field fluctuations throughout a broad range of scales. These often include an inertial range where a2magnetohydrodynamic turbulent cascade is observed. The multifractal properties of the turbulent3cascade, strictly related to intermittency, are observed here during the transition from quasi-parallel to4quasi-perpendicular magnetic field with respect to the bow-shock normal. The different multifractal5behavior in the two regions is analyzed. A standard coarse-graining technique has been used6to evaluate the generalized dimensions and the corresponding multifractal spectrumf(α). A7p-model fit provided a quantitative measure of multifractality and intermittency, to be compared with8standard indicators: the width of the multifractal spectrum, the peak of the kurtosis, and its scaling9exponent. Results show a clear transition and sharp differences in the intermittency properties for the two regions.

Keywords : magnetos heath, turbulence, multifractal, instabilities
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