



Intermittency of solar system plasma turbulence near Venus and Earth

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We analyze magnetic field data from Venus Express (VEX) and CLUSTER to investigate the turbulent properties of the solar wind and the Earth's and Venus' magnetosheaths. A systematic study of the PDFs (Probability Distribution Functions) of the measured magnetic fluctuations and their fourth order moments (kurtosis) reveals numerous intermittent time series. The presence of intermittency is marked by non-Gaussian PDFs with heavy wings and a scale dependent kurtosis. Higher order analyses on the scale dependence of several moment orders of the PDFs, the structure functions, along with the scaling of the kurtosis allow for a selection of scales that pertain to different scaling regimes, governed by different physics. On such sub-ranges of scales we investigate the fractal structure of fluctuations through the Rank Ordered Multifractal Analysis – ROMA (Chang and Wu, 2008). ROMA is applied to a selection of intermittent magnetic field time series in the solar wind and planetary magnetosheaths and helps to quantify the turbulence properties through the estimation of a spectrum of local Hurst exponents.

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