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# Survey of the spectral properties of turbulence in the solar wind, the magnetospheres of Venus and Earth, at solar minimum and maximum

Marius M. Echim (1,2) and the STORM Team

(1) Belgian Institute for Space Aeronomy, Space Physics, Brussels, Belgium (marius.echim@oma.be, +32 2 3748 423), (2) Institute for Space Sciences, Magurele, Romania

In the framework of the European FP7 project STORM ("Solar system plasma Turbulence: Observations, inteRmittency and Multifractals") we analyze the properties of turbulence in various regions of the solar system, for the minimum and respectively maximum of the solar activity. The main scientific objective of STORM is to advance the understanding of the turbulent energy transfer, intermittency and multifractals in space plasmas. Specific analysis methods are applied on magnetic field and plasma data provided by Ulysses, Venus Express and Cluster, as well as other solar system missions (e.g. Giotto, Cassini). In this paper we provide an overview of the spectral properties of turbulence derived from Power Spectral Densities (PSD) computed in the solar wind (from Ulysses, Cluster, Venus Express) and at the interface of planetary magnetospheres with the solar wind (from Venus Express, Cluster). Ulysses provides data in the solar wind between 1992 and 2008, out of the ecliptic, at radial distances ranging between 1.3 and 5.4 AU. We selected only those Ulysses data that satisfy a consolidated set of selection criteria able to identify "pure" fast and slow wind. We analyzed Venus Express data close to the orbital apogee, in the solar wind, at 0.72 AU, and in the Venus magnetosheath. We investigated Cluster data in the solar wind (for time intervals not affected by planetary ions effects), the magnetosheath and few crossings of other key magnetospheric regions (cusp, plasma sheet). We organize our PSD results in three solar wind data bases (one for the solar maximum, 1999-2001, two for the solar minimum, 1997-1998 and respectively, 2007-2008), and two planetary databases (one for the solar maximum, 2000-2001, that includes PSD obtained in the terrestrial magnetosphere, and one for the solar minimum, 2007-2008, that includes PSD obtained in the terrestrial and Venus magnetospheres and magnetosheaths). In addition to investigating the properties of turbulence for the minimum and maximum of the solar cycle we also analyze the spectral similarities and differences between fast and slow wind turbulence. We emphasize the importance of our data survey and analysis in the context of understanding the solar wind turbulence, the exploitation of data bases and as a first step towards developing a (virtual) laboratory for studying solar system plasma turbulence.

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