

# **MONITORING OF TURBULENCE UPSTREAM AND DOWNSTREAM OF THE BOW SHOCK USING THE CLUSTER OBSERVATIONS**

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The paper concerns with the study of plasma turbulence, upstream and downstream of the quasi-parallel bow shock (BS), using the FGM magnetic records of the Cluster mission. The turbulence and its intermittent nature have already been evidenced by several studies, in these regions. We argue that the level of intermittency can be monitored in terms of space and time by intermittecy or multifractal model parameters obtained from turbulent (mostly nonlinear) analyses (e.g. probability density function, structure function, or multifractal spectrum analyses) of the continuous spacecraft records. In the analyses, the multi-spacecraft observations have a key role, since with them the intermittency in the plasma fluctuations can be revealed not only in temporal but also in spatial scales. We intend to find relationship between the intermittency level upstream the bow shock and the varying solar wind (SW) parameters, such as the velocity, plasma density, Mach number, etc. Furthermore, the connection between the turbulent properties of the upstream region and the Pc3-Pc4 magnetic pulsation activities observed in Earth magnetic observatories is also intended to be studied. The reason is that part of the surface observations of the Pc3-Pc4 pulsation phenomena origins from the upstream region as a result of enhanced wave activities caused by ion-cyclotron resonance of SW protons backstreaming from the BS boundary. The UWs are carried by the SW towards the magnetosheath and the magnetopause, and finally enter the magnetosphere generating clear pulsation signals in Earth magnetic records. In the comparative studies, the pulsation records of the MM100 meridional magnetometer array are used.

Turbulence, Cluster mission, solar wind

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