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Alfvenicity of the solar wind near Earth

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It is a well known fact that, in the presence of intense interplanetary disturbances (such as Interplanetary Coronal Mass Ejections ICMEs or Stream Interaction Regions SIRs) the interaction between the solar wind and the terrestrial magnetosphere generates geomagnetic storms and substorms. However, notable geomagnetic variations have also been observed in the absence of such transient structures. Previous studies have shown that certain increases in the levels of MHD turbulence in the solar wind may have a very important role in the coupling of the solar wind with the magnetosphere at high latitudes [e.g., D'Amicis et al., 2009]. It has even been suggested that the relationship between the interplanetary medium and the magnetosphere is controlled by the level of turbulence in the solar wind [Borovsky & Funsten, 2003].
In this work, we use data from two instruments on board the ACE satellite: SWEPAM and MAG, during the period of time between 03/1998 - 12/2009. Furthermore, we make use of the ICME events catalog of Richardson & Cane [Richardson & Cane, 2010] and the SIR events catalog of Jian [Jian et al., 2006]. We perform a statistical study of turbulent properties of the solar wind in the terrestrial environment, splitting Parkerian solar wind and transient events. The results of this study will help to better understand the geomagnetic fluctuations near polar regions, and will provide elements to develop operational products in Space Weather in Antarctic regions.

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