



Ionospheric Turbulence Development during St. Patrick's Day Storm

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“Characterization of Ionospheric Turbulence level by Swarm constellation (INTENS)” is a study recently approved by ESA in the framework of “EO Science for Society Permanently Open Call”. The aim of the study is to investigate the nature of geomagnetic field and plasma parameters (i.e. electron density and temperature) fluctuations, as well as their scaling features during different geomagnetic disturbance conditions, to unveil the role played by the magnetohydrodynamic (MHD) turbulence on the ionospheric environment in creating multi-scale plasma structures and plasma inhomogeneities.

In the framework of this study, we present a preliminary analysis of the properties of the geomagnetic field and plasma parameters fluctuations produced by ionospheric and magnetospheric electric currents during the St. Patrick's geomagnetic storm occurred on 17 March 2015. We analyse the scaling features of the external contribution of the geomagnetic field as well as some plasma parameters recorded simultaneously by the three satellites of the Swarm constellation during a period of 11 days (15–25 March 2015). The idea is to provide a characterisation of the different ionospheric turbulence regimes of the medium crossed by the Swarm constellation, on scales from hundreds of kilometres to a few kilometres, and to study variations of the scaling features of the geomagnetic field and ionospheric plasma during the development of the geomagnetic storm. The investigation proposed is an example of the capability of Swarm data to provide new insights on the ionosphere-magnetosphere coupling, which can be relevant in the framework of Space Weather related studies.

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