# RELATIONSHIP BETWEEN ULF ACTIVITY AND RELATIVISTIC ELECTRON FLUX IN THE MAGNETOSPHERE

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The comparative statistical analysis has elucidated the role of ULF activity in the magnetospheric field and particle response to the solar wind forcing. Some new features of the correspondence between the various SW/IMF parameters and interplanetary/magnetospheric turbulence level has been revealed, apart from the well-known correlations. Special attention is paid to the inter-relation between high-energy electron flux intensity and ULF activity.
As a quantitative measure of the SW/IMF turbulence level and the ground ULF activity in Pc5 frequency band we have used the ULF wave power indices constructed from the world array of ground magnetometer data and the plasma/magnetic data from interplanetary spacecraft. The ULF index demonstrates a high positive correlation with the electron flux for the whole period of observations. An empirical model for the relativistic electron dynamics, constructed by means of the Partial Least Squares (PLS) method, will be presented. As input parameters for this model the following hourly space weather parameters have been chosen: Dst, Kp, AE, ULF, and cumulative ULF indexes, solar wind speed and density, and IMF components. This model is able to predict electron flux levels several hours in advance, even when the solar wind data are not available, and is suitable for the spacecraft breakdown risk evaluation. The PLS method permits not just to predict the responses, but also to understand the underlying relationship between variables and to estimate the contribution of each input parameter. ULF wave activity in the magnetosphere has been proved to play an important role in the relativistic electron flux enhancements.

ULF waves, relativistic electron dynamics

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