Geophysical Research Abstracts
Vol. 14, EGU2012-8135-1, 2012
EGU General Assembly 2012

Multi-satellite, multi-instrument and ground-based observations analysis and study of ULF wave phenomena and products

G. Balasis (1), I. A. Daglis (1), M. Georgiou (1,2), C. Papadimitriou (1,2), A. Anastasiadis (1), I. Sandberg (1), and R. Haagmans (3)

(1) National Observatory of Athens, Institute for Space Applications and Remote Sensing, Athens, Greece (gbalasis@space.noa.gr, +302106138343), (2) Section of Astrophysics, Astronomy and Mechanics, Department of Physics, University of Athens, Greece, (3) European Space Research and Technology Centre, European Space Agency, Netherlands

Multi-satellite, multi-instrument and ground-based observations analysis and study of ULF wave phenomena and products (ULFwave) is a new ESA funded study. This study combines multi-spacecraft with ground-based monitoring of the geospace environment in order to analyze and study ULF waves; in this framework, the study also develops and delivers relevant tools. In the preparation phase of ESA's Swarm mission, the analysis of specific ULF wave events can help to explain the processes that play a crucial role in the generation of waves and evolution of specific propagation characteristics. The latter is expected to be coupled with radiation belt and ring current dynamics. Data from CHAMP and the ongoing Cluster and THEMIS missions can be used to study this interrelation in detail. A better understanding of the generation and propagation of waves will also allow to geophysically validate some of Swarm's data products, especially those related to the magnetic and electric fields in the magnetosphere. As a first step toward this goal a semi-automatic time series analysis tool has been developed. The technique is based on wavelet transform and is particularly suitable for the analysis of magnetic field measurements collected by a low Earth orbit (LEO) mission. In the case of the CHAMP satellite, for instance, the tool has proved to be computational efficient, thus, giving promising results for the future application of the method to data from the Swarm mission. This study is funded through ESTEC contract 4000103770/11/NL/JA/ef.