

Swarm's Absolute Scalar Magnetometers Burst Mode Results

Pierdavide Coisson¹, Pierre Vigneron¹, Gauthier Hulot¹, Raul Crespo Grau^{1,2}, Laura Brocco¹, Xavier Lalanne¹, Olivier Sirol¹, Jean-Michel Leger³, Thomas Jager³, Francois Bertrand³, Axel Boness³ and Isabelle Fratter⁴, (1)Institut de Physique du Globe de Paris, Paris, France, (2)Observatorio Geofisico Central, Instituto Geografico Nacional, Madrid, Spain, (3)CEA-LETI, Grenoble, France, (4)CNES French National Center for Space Studies, Toulouse Cedex 09, France

Abstract:

Each of the three Swarm satellites embarks an Absolute Scalar Magnetometer (ASM) to provide absolute scalar measurements of the magnetic field with high accuracy and stability. Nominal data acquisition of these ASMs is 1 Hz. But they can also run in a so-called "burst mode" and provide data at 250 Hz. During the commissioning phase of the mission, seven burst mode acquisition campaigns have been run simultaneously for all satellites, obtaining a total of ten days of burst-mode data. These campaigns allowed the identification of issues related to the operations of the piezo-electric motor and the heaters connected to the ASM, that do not impact the nominal 1 Hz scalar data.

We analyze the burst mode data to identify high frequency geomagnetic signals, focusing the analysis in two regions: the low latitudes, where we seek signatures of ionospheric irregularities, and the high latitudes, to identify high frequency signals related to polar region currents. Since these campaigns have been conducted during the initial months of the mission, the three satellites were still close to each other, allowing to analyze the spatial coherency of the signals. Wavelet analysis have revealed 31 Hz signals appearing in the night-side in the equatorial region.