



Geomagnetic disturbances imprints in ground and satellite altitude observatories

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The temporal evolution of the geomagnetic field and its variations have been repeatedly studied from both ground observatories and near-earth orbiting platforms. With the advent of the space age and the launches of geomagnetic low altitude orbits satellites, a global coverage has been achieved. Since Magsat mission, more satellites were put into orbit and some of them are still collecting data enhancing the spatial and temporal descriptions of the field. Our study uses new data gathered by the latest SWARM satellite mission launched on November, 22nd 2013. It consists of a constellation of three identical satellites carrying on board high resolution and accuracy scientific equipment. Data from this constellation will allow better understanding the multiscale behavior of the geomagnetic field.

Our goal is to analyze and interpret the geomagnetic data collected by this Swarm mission, for a given period and try to separate the external disturbances from internal contributions. We consider in the study the variation of the horizontal component H , for different virtual geomagnetic observatories at the satellite altitude. The analysis of data by Swarm orbital segments shows clearly the external disturbances of the magnetic field like that occurring on 27th of August 2014. This perturbation is shown on geomagnetic indexes and is related to a coronal mass ejection (CME). These results from virtual observatories are confirmed, by the equivalent analysis using ground observatories data for the same geographic positions and same epochs.

Key words: Geomagnetic field, external field, geomagnetic index, SWARM mission, virtual observatories.