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LITHOSPHERIC-IONOSPHERIC COUPLING EFFECTS: OBSERVATIONS PRIOR TO THE 15 DECEMBER 2017, INDONESIA EARTHQUAKE USING SPACE BORNE AND GROUND SENSOR

Abstract

This paper studies the behavior of the pre-earthquake ionospheric by analyzing magnetic field variations from Swarm satellites and Magdas data. The Swarm satellite will pass through the study region two to four times daily. The data from the lithosphere layer are collected by using the MAGDAS data. Other external factors that may possibly interfere with the magnetic field data, such as geomagnetic indices, will be considered to ensure the collected data are in quiet conditions before and during the event of the earthquake. Variations of the magnetic field data (H, D, and Z) 14 days before the earthquake were observed to indicate the perturbation of the magnetic field profile. Monitoring these parameters is one of the methods used to study earthquake precursors in the ionosphere. This study involved a large earthquake in Sumatra that occurred on 15 December 2017 with a magnitude of 7.5. Significant anomalous behavior of the magnetic field was observed 14 days before the earthquake.