Geophysical Research Abstracts
Vol. 18, EGU2016-15685, 2016
EGU General Assembly 2016

Investigating dynamical complexity in the time series of the upgraded ENIGMA magnetometer array using various entropy measures

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The HellENIc GeoMagnetic Array (ENIGMA) is a network of 3 ground-based magnetometer stations in the areas of Trikala, Attiki and Lakonia in Greece that provides measurements for the study of geomagnetic pulsations, resulting from the solar wind - magnetosphere coupling. ENIGMA magnetometer array enables effective remote sensing of geospace dynamics and the study of space weather effects on the ground (i.e. Geomagnetically Induced Currents - GIC). ENIGMA contributes data to SuperMAG, a worldwide collaboration of organizations and national agencies that currently operate more than 300 ground-based magnetometers. ENIGMA is currently extended and upgraded receiving financial support through the national funding KRIPIS project and European Commission's BEYOND project. In particular, the REGPOT project BEYOND is an FP7 project that aims to maintain and expand the existing state-of-the-art interdisciplinary research potential, by Building a Centre of Excellence for Earth Observation based monitoring of Natural Disasters in south-eastern Europe, with a prospect to increase its access range to the wider Mediterranean region through the integrated cooperation with twining organizations. This study explores the applicability and effectiveness of a variety of computable entropy measures to the ENIGMA time series in order to investigate dynamical complexity between pre-storm activity and magnetic storms.