



## **Investigating dynamical complexity in the topside ionosphere using information-theoretic measures**

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Recently, many novel concepts originated in dynamical systems or information theory have been developed, partly motivated by specific research questions linked to geosciences, and found a variety of different applications. This continuously extending toolbox of nonlinear time series analysis highlights the importance of the dynamical complexity to understand the behavior of the complex Earth's system and its components. Here, we propose to apply such new approaches, mainly a series of entropy methods to the time series of the Earth's magnetic field measured by the Swarm constellation. Swarm is an ESA mission launched on November 22, 2013, comprising three satellites at low Earth polar orbits. The mission delivers data that provide new insight into the Earth's system by improving our understanding of the Earth's interior as well as the near-Earth electromagnetic environment. We show successful applications of methods originated in information theory to quantitatively studying complexity in the dynamical response of the topside ionosphere, at Swarm altitudes, associated with the intense magnetic storms occurred in 2015.