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Large geomagnetic storms: A multi-scale analysis

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Turbulence and scaling features are common properties of geomagnetic time series. In the course of the last years it has been widely documented how scaling properties of geomagnetic time series display changes depending on the geomagnetic activity level. Here, we present a study of the multi-scale features of some large geomagnetic storms by applying the Hilbert-Huang decomposition technique. This method, that is alternative to traditional data-analysis and is designed specifically for analyzing nonlinear and nonstationary data, is applied to long time series of Sym-H index relative to periods including large geomagnetic disturbances. The spectral and scaling features of the intrinsic mode functions (IMFs) into which Sym-H time series can be decomposed, as well as those of the Sym-H time series itself are studied considering different geomagnetic activity levels.