



## **Observing electromagnetic signals as earthquake precursors in terms of complexity**

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The present study focuses on spectral analysis of electromagnetic signals (EM) in relation to earthquake events over 5ML in Greece, in the prospect of identifying possible patterns that could be defined as earthquake precursors. EM recordings in six frequency bands (3 KHz NS, 3 KHz EW, 10 KHz NS, 10 KHz EW, 41 MHz and 46 MHz) have been used, acquired from 10 EM stations in different regions, between the years 2004 and 2009. The overall response of the electromagnetic network has been studied by correlating the spectrograms of Fourier transform of short term frame analysis and long term frame analysis respectively. Recent studies suggest that Fourier transform is not suitable for non-stationary signals due to the degradation of the frequency estimation. However this work does not focus on specific frequency estimations but on the overall behavior and variations of the spectrogram's amplitude frequency. Drawing on the results, experimental correlation and observation charts will be presented in order to support the case that these EM emissions, which are possibly related to ensuing earthquake events, are in some cases not only short term phenomena of the crust failure but also depict longer in time processes that characterize certain seismic activity.