



A multidisciplinary analysis of MHz-kHz pre-seismic emissions associated with recent significant earthquakes in Greece

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A series of significant surface earthquakes (EQs) occurred recently, i.e., during 2008 and 2009, on land or near coast-line in Greece. Clear MHz-kHz electromagnetic (EM) anomalies have been systematically detected over periods ranging from a few days to a few hours prior to these recent EQs, with the MHz radiation appearing earlier than the kHz. A multidisciplinary analysis in terms of fault modelling, laboratory experiments, scaling similarities of multiple fracturing of solid materials, fractal electrodynamics, criticality, universality, fractal spectral analysis, detrended fluctuation analysis, and complexity, validates the association of the detected pre-seismic EM emissions with the fracturing process in the focal area of the impending EQ. We underline that the extracted results are in harmony with previous ones supporting the consideration that the kHz part could be due to the fracture of the backbone of large asperities that sustain the system while the MHz part could be originated during the fracture of heterogeneous medium that surrounds the family of asperities.