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Evaluation of disturbances detected on a VLF/LF receiver inside the preparation zone of a sequence of earthquakes.

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This work investigates the occurrence of disturbances received prior and during a sequence of 6 earthquakes that took place during November 2016 (08-11-2017, mb=4.1, 10-11-2017, mb=4.8, 11-11-2017, ML=3.7, 16-11-2017, ML=4.2, 18-11-2017, mb=4.9, 30-11-2017, ML=4) with depths less than 8Km and epicenters around 5km from each other in Thessaloniki, Greece, and more importantly 30Km from a VLF/LF receiver, well inside the preparation zone, according to Dobrovolsky's equation.
For the purpose of this paper, data acquired in Thessaloniki, Greece (40.59N, 22,78E) from ten VLF and LF transmitters around Europe are processed. Data from other receivers in the network are also assessed to establish comparative analysis and study the differences between the received disturbances of the same phenomenon from a receiver in close proximity to the events and another receiver away from the events.
The uniqueness of this event that took place during November 2016 lies in the fact that there is a sequence of relatively strong earthquakes in close proximity to the receiver which has not occurred again during the operation of the receiver located in Thessaloniki, and the availability of data received from other receivers in the network to compare, thus bearing the significance to further study and analyze
The receivers have been developed by Elettronika Srl and are part of the International Network for Frontier Research on Earthquake Precursors (INFREP).
The signals undergo transformation using a noise assisted version of the Hilbert Huang Transform (HHT) using the Complete Ensemble Empirical Mode Decomposition with Adaptive Noise (CEEMDAN) and also using Zhao-Atlas-Marks (ZAM) Transform and the relevant spectra are produced.
Based upon the results which are characterized by a spread of disturbances along most received signals on the spectra of the proximal receiver, the significance of the above disturbances is discussed and the merits of a dense receiver network for the detection of such phenomena is evaluated.