



Pre-seismic radio anomalies observed on the occasion of the Mw= 6.7 and Mw = 5.0 earthquakes occurred offshore near the southwest coast of Turkey on July-August, 2017

Pier Francesco Biagi (1), Roberto Colella (1), Luigi Schiavulli (1), Anita Ermini (2), Mohammed Boudjada (3), Hans Eichelberger (3), Konstantinos Katzis (4), Manana Kachakhidze (5), Michael Contadakis (6), Christos Skeberis (6), Dimitrios Stratakis (7), Iren Moldovan (8), and Hugo Silva (9)

(1) Università di Bari, Physics Department, Bari, Italy (pf.biagi@gmail.com), (2) Department of Industrial Engineering, University of Tor Vergata, Rome, Italy, (3) Space Research Institute, Austrian Academy of Sciences, Graz, Austria, (4) Department of Computer Science and Engineering, European University Cyprus, Nicosia, Cyprus, (5) Saint Andrew Georgian University, Faculty of Informatics, Mathematics and Natural Sciences, Tbilisi, Georgia, (6) Department of Surveying & Geodesy, University of Thessaloniki, Thessaloniki, Greece, (7) Department of Informatics Engineering, Technological Educational Institute of Crete, Heraklion, Greece, (8) National Institute of Earth's Physics, Seismological Department, Bucharest, Magurele, Romania, (9) Renewable Energies Chair, University of Évora, IIFA, Évora, Portugal

The INFREP radio network has been operational in Europe since 2009, in order to reveal possible radio precursors of earthquakes. Currently the network is consisted of ten receivers. There are two receivers located in Italy, two in Romania and two in Greece whereas Austria, Portugal, Cyprus and Georgia have one each. The receivers, realized by an Italian factory, can measure the intensity of 10 radio signals in the VLF (10-50 kHz) and LF (150-300 kHz) bands. On July 20, 2017 a strong (Mw=6.7) earthquake occurred offshore, near the coast of Turkey and Kos island (Greece); on August 8 an earthquake with Mw=5.0 occurred practically in the same zone. The focal depth was 10 km for both the events. The epicentres are inside the "sensitive" area of the INFREP network. On both the occasions, evident pre-seismic disturbances were pointed out in the DHO (23.4 kHz) signal collected by the Cyprus receiver. On November 7, an earthquake with Mw =5.1 occurred offshore at about 120 km from the previous ones, on south-east direction. Also in this case an anomaly was observed on the quoted signal. The focal depth of the earthquake was 70 km, large enough to produce detectable anomalies; in addition a more evident anomaly appeared on the DHO radio signal collected by the Crete receiver, the sensitive Fresnel zone of which is out the epicentre area of the earthquake. These circumstances suggest a possible cause of the anomalies different from the seismicity and indeed a disturbed meteorological situation pointed out. All the anomalies we present, were revealed by the on-line warning system based on the Wavelet analysis, planned and realized in the frame of the INFREP cooperation.