The European Network for studying the radio precursors of earthquakes: Principal Component Analysis of LF radio signals collected during July 2009 - April 2011

T. Maggipinto (1), P.F. Biagi (1), F. Righetti (1), L. Schiavulli (1), T. Ligonzo (1), A. Ermini (2), I.A. Moldovan (3), A.S. Moldovan (4), H.G. Silva (5), M. Bezzeghoud (5), M.E. Contadakis (6), D.N. Arabelos (6), T.D. Xenos (6), and A. Buyuksarac (7)

(1) University of Bari, Department of Physics, Bari, Italy (t.maggipinto@fisica.uniba.it), (2) Department of Industrial engineering, University of Tor Vergata, Rome, Italy, (3) National Institute of Earths Physics, Seismological Dept, Bucharest, Magurele, Romania, (4) AZEL-Designing Group S.R.L., Bucharest, Magurele, Romania, (5) Geophysical Centre of Evora and Physics Department, ECT, University of Evora, Portugal, (6) University of Thessaloniki, Department of Surveying & Geodesy, Thessaloniki, Greece, (7) Canakkale Onsekiz mart University, Dept. of Geophysics, Canakkale, Turkey

Since 2009 a network of VLF (20-60 kHz) and LF (150-300 kHz) radio receivers was put into operation in Europe in order to study the disturbances produced by the earthquakes on the propagation of these signals. In 2011 the network for LF signals was formed by six receivers located two in Italy and one in Greece, Portugal, Romania, and Turkey. The LF radio data collected during about two years have been analysed. Each radio signal has been split in day-time and night-time data; then, the earthquakes with $M \geq 5.0$, occurred in the same period, located in a 300 km radius around each receiver/transmitter and within the 5th Fresnel zone related to each transmitter-receiver path, have been selected. In this study we adopt the Principal Component Analysis (PCA) to study the radio signal anomalies possibly related to earthquake activity. A detailed comparison with similar studies that use wavelet analysis is done and advantages or drawback of the two methods are pointed out.