

Multi-Channel correlation analysis for November, 2014 South-Eastern Carpathians (Romania) sequence

Felix Borleanu, Anca Otilia Placinta, Maria Rogozea, Mihaela Popa, and Mircea Radulian
National Institute for Earth Physics, Magurele, Romania (felix@infp.ro)

Multi-channel correlation technique was applied to the seismic sequence occurred in 2014 in the South-Eastern Carpathians (Romania) to identify the repetitive sources along the fault system. Multi-channel correlation detectors known also as matched filters represent a useful tool to identify repeating events. Comparing with conventional detectors, the multi-channel analysis has to match for each of the array station the time differences between S and P-waves as well as the relative arrival times of P and S –waves which cross the arrays. Three months of data recorded by the two arrays, Bucovina (BURAR) and Plostina (PLOR), operating in Romania were used to run the detector. Many of the detected events were associated with the recordings of 3-C seismic stations installed nearby the epicenter allowing the combination of classical and relative location techniques. A relative magnitude was computed using root mean square (RMS) algorithm and compared with the local magnitude estimated for the events listed in seismic bulletins computed within the Romania Data Centre of the National Institute for Earth Physics. Results show a high efficiency of the multi-channel correlation detector to identify repetitive events and to provide locations of high accuracy by relative location techniques. At the same time, the errors of the relative magnitude estimations are decreased as compared with the errors of the local magnitudes determined by the routine procedures. The multi-channel correlation technique can be applied as an alternative tool extremely useful and efficient in measuring clustered events.