



The performance of the stations of the Romanian seismic network in monitoring the local seismic activity

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The seismic survey of the territory of Romania is mainly performed by the national seismic network operated by the National Institute for Earth Physics of Bucharest.

After successive developments and upgrades, the network consists at present of 123 permanent stations equipped with high quality digital instruments (Kinematics K2, Quantera Q330, Quantera Q330HR, PS6-24 and Basalt digitizers) – 102 real time and 20 off-line stations – which cover the whole territory of the country.

All permanent stations are supplied with 3 component accelerometers (episenzor type), while the real time stations are in addition provided with broadband (CMG3ESP, CMG40T, KS2000, KS54000, KS2000, CMG3T, STS2) or short period (SH-1, S13, Mark 14c, Ranger, GS21, L22_VEL) velocity sensors.

Several communication systems are currently used for the real time data transmission: an analog line in UHF band, a line through GPRS (General Packet Radio Service), a dedicated line through satellite, and a dedicated line provided by the Romanian Special Telecommunication Service.

During the period January 1, 2006 – June 30, 2013, 5936 shallow depth seismic events – earthquakes and quarry blasts – with local magnitude $ML \geq 1.2$ were localized on the Romanian territory, or in its immediate vicinity, using the records of the national seismic network; 1467 subcrustal earthquakes (depth ≥ 60 km) with magnitude $ML \geq 1.9$ were also localized in the Vrancea region, at the bend of the Eastern Carpathians.

The goal of the present study is to evaluate the individual contribution of the real time seismic stations to the monitoring of the local seismicity.

The performance of each station is estimated by taking into consideration the fraction of events that are localised using the station records, compared to the total number of events of the catalogue, occurred during the time of station operation.

Taking into account the nonuniform space distribution of earthquakes, the location of the site and the recovery rate of reliable data are defining elements for the usefulness of a particular station.

Our analysis provides a measure of station reliability, essential indicator for decisions regarding the increasing of effectiveness and future development of the Romanian seismic network.