



## **Site characterization of the Romanian Seismic Network stations: a national initiative and its first preliminary results**

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The seismic activity in Romania is dominated by the intermediate-depth earthquakes occurring in Vrancea region, although weak to moderate crustal earthquakes are produced regularly in different areas of the country. The National Institute for Earth Physics (NIEP) built in the last years an impressive infrastructure for monitoring this activity, known as the Romanian Seismic Network (RSN). At present, RSN consists of 122 seismic stations, of which 70 have broadband velocity sensors and 42 short period sensors. One hundred and eleven stations out of 122 have accelerometer sensors collocated with velocity sensors and only 10 stations have only accelerometers. All the stations record continuously the ground motion and the data are transmitted in real-time to the Romanian National Data Center (RoNDC), in Magurele. Last year, NIEP has started a national project that addresses the characterization of all real-time seismic stations that constitute the RSN. We present here the steps that were undertaken and the preliminary results obtained since the beginning the project. The first two activities consisted of collecting all the existent technical and geological data, with emphasize on the latter. Then, we performed station noise investigations and analyses in order to characterize the noise level and estimate the resonances of the sites. The computed H/V ratios showed clear resonant peaks at different frequencies which correlate relatively well with the thickness of the sedimentary package beneath the stations. The polarization analysis of the H/V ratios indicates for some stations a strong directivity of the resonance peak which suggests possible topographic effects at the stations. At the same time, special attention was given to the estimation of the site amplification from earthquake data. The spectral ratios obtained from the analysis of more than 50 earthquakes with magnitudes ( $M_w$ ) larger than 4.1 are characterized by similar resonance peaks as those obtained from noise H/V ratios in case of the stations with strong site effects. On the contrary, the spectral curves are flat for some stations located on hard rock or show amplifications around two on wide frequency band for stations located on deep sediments. Finally, both active (MASW) and passive (ReMi) surface waves surveys were performed at several sites to estimate the shallow velocity structure beneath the stations.