



A Review of Seismic Monitoring in Romania: improved earthquake detection network capabilities

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The instrumental era of earthquake monitoring for Romania started with the development of its own real-time seismic network since 2002 by the National Institute for Earth Physics (NIEP). Over the years different upgrades were made improving earthquake monitoring capabilities. Today NIEP operates a real time seismic network which now consist of over 100 stations and two seismic arrays. Also, NIEP is serving the research community by providing waveform and parametric data in near real time trough European Integrated Data Archive (EIDA). In order to improve detection capabilities, we need to have a good knowledge of quality control. The quality of seismic waveform data and related metadata is essential for scientific analysis and data interpretation. Algorithms were created to calculate automatically data quality parameters and to work with big amount of data. This will allow to monitor changes and variations in data quality over different time and scales which in the end will lead to have the best quality data based on these parameters. Another important factor to evaluate seismic stations performance is by providing quick and easy transition between visualization of the frequency and time domains. The used software is based on the probability density functions (PDF) of power spectral densities (PSD) (McNamara and Buland, 2004). With this method we can estimate the overall station quality and a baseline level of Earth noise at each site. In this study the software is used to characterize the current and the past performance of the seismic stations and to detect problems with the recording system or sensor and to evaluate the quality of data and metadata. Finally, the analysis of the detection capabilities regarding the evolution of the National Seismic Network in Romania demonstrates the effect of the changes and their impact to the earthquake catalog.