Geophysical Research Abstracts
Vol. 18, EGU2016-12313, 2016
EGU General Assembly 2016

Investigation of anthropogenic and natural noise at Bucovina and Plostina seismic arrays, Romania

Bogdan Grecu, Felix Borleanu, Cristian Neagoe, Bogdan Zaharia, and Dragos Tataru
National Institute for Earth Physics, Magurele, Romania (bgrecu@infp.ro)

At present, two seismic arrays are installed on the Romanian territory and record continuously the ground motion and send the data in real time to the National Data Center, in Magurele, Romania. One array is located in the Northern part of the country, in Bucovina (BURAR array), while the second one (Plostina - PLOR array) is situated right above the Vrancea seismic nest, the region with the highest seismic activity in Romania. The BURAR array consists of ten stations with seismic sensors installed in boreholes at depths of 30 and 50 m, covering an area of 5x5 km2. Nine stations are equipped with GS21 short period vertical sensors and one station has a 3-component broadband sensor (KS54000). In 2008, three more 3-component broadband sensors (CMG-40T) were installed at surface; two of them collocated with existing sites and one in a different site. The PLOR array consists of 7 elements equipped with 3-component broadband sensors (CMG40T – 6 and STS2 – 1). The aperture of the array is 2.5 km, with a distance between inner elements of 250 m and 1100 m for the outer elements.
We analyze the power spectral density of BURAR and PLOR arrays continuous records to characterize the temporal noise variations and investigate their influence on the detection capabilities for intermediate-depth earthquakes, occurred in Vrancea region, as well as for local crustal events produced in various places of the country. We also perform polarization and array specific analyses to identify the main sources of the high frequency noise and secondary microseisms. Diurnal variations caused by anthropogenic activities have been observed at all stations, but their significance depends strongly on the distance to the sources of the noise. For BURAR array, the maximum difference between nighttime and daytime noise levels is 25 dB, while for PLOR array we observe differences up to 42 dB. In the microseismic band, the noise variations are correlated well with the seasons and have their maximum during the colder months. The difference between the noise levels during warmer and colder months reaches up to 20 dB for most of the stations. Seasonal variations are also observed at short period stations of the BURAR array in the high frequency range (1-14 Hz). These variations are higher during summer and smaller during winter months, as opposite to the seasonal variations observed in the microseismic range. Finally, we show that diurnal variations influence to some extent the detection capability of the stations, particularly for earthquakes with magnitude smaller than 3.5.