

Seismic noise at Bucovina (Romania) seismic array and its implication in detection of regional and distant events

Felix Borleanu, Bogdan Grecu, Cristian Neagoe, Daniela Ghica, Liviu Manea , and Mihaela Popa
National Institute for Earth Physics, Magurele, Romania (felix@infp.ro)

The Bucovina Romanian Seismic Array (BURAR) is located in the northern part of Romania in the neighborhood of the Ukraine border. It was installed in cooperation with the Air Force Technical Applications Center (USA) and has been operating since 2002. BURAR consists of 10 seismic sensors (nine vertical component short-period and one broadband three-component) installed in boreholes and distributed on 5×5 km area. The array was upgraded in 2008 when 3 new sensors (CMG40T) were installed at the surface: two in the same locations with BUR01, BUR05 and one in a different site. The present study investigates on one hand how various characteristics of seismic noise may affect the overall array detection capabilities for regional and teleseismic phases associated with the seismic events identified within NEIC and ROMPLUS (Oncescu et al. 1999) catalogs. On the other, hand a detailed comparison of the noise level variation between the boreholes and surface sensors was performed to emphasize the potential influences expressed by the surface sensors. The results show a high detection capability and a high degree of variability of noise level between the surface and boreholes sensors. The overall noise characteristics exhibit diurnal variations caused by anthropogenic activities as well as seasonal variations in the high-frequency range. Several noise sources were highlighted using frequency-wavenumber analysis.