



Enhancement of monitoring for local and regional earthquakes using array techniques and calibration at BURAR (northern Romania) station

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Bucovina array (BURAR) is a high-quality monitoring system located in the northern part of Romania, in SE Carpathians, installed in 2002 and operated in cooperation with Air Force Technical Applications Center – Florida (USA). The system consists of 10 stations (9 short-period and 1 broadband) roughly circularly distributed with 5 km aperture. The BURAR location in a complex seismotectonic area with strong lateral variations, makes imperative the proper calibration of the recording system in order to enhance its capability to identify and localize seismic events. Thus, of highest significance is the strong lateral inhomogeneity of the lithosphere in connection with the sharp concentration of intermediate-depth earthquakes at the SE Carpathians arc bend, in Vrancea region. A significant intermediate-depth seismicity is generated here in an extremely confined focal volume. Understanding the characteristic structural features related to the main seismotectonic and magmatic processes in this area is essential in correctly discerning seismic phases and explaining the observed deviations of their travel times from those expected for global average structural models. Parametrization of regional model for different azimuths around BURAR array is proposed based on local and regional events observed within about 2000 km radius. Azimuth bias information and distance dependent correction factors in azimuth and slowness are investigated and interpreted in correlation with the regional modeling features. The new parametrization and calibration are applied to enhance signal detection and seismic phase identification in case of local and regional earthquakes recorded by BURAR array. The ability of the BURAR array to detect, localize and evaluate magnitude of local and regional events as station alone is also investigated.