

Romania National Data Centre Contribution to Nuclear Test Monitoring

Five nuclear tests (in 2006, 2009, 2013 and two in 2016) have been conducted by the Democratic People's Republic of Korea (DPRK). The explosions were detected by International Monitoring System (IMS) and located at International Data Centre (IDC), event magnitude estimates (mb from 4.1 to 5.1) indicating the increasing of energy chronologically released. Seismic signals generated by the DPRK events detected by Romanian Seismic Network (RSN) and by other regional monitoring stations were used to compute event locations at Romania National Data Centre (ROM_NDC). A comparison between solutions obtained at ROM_NDC and IDC is presented. However all the IDC locations are better constrained as a consequence of IMS global coverage, a significant enhancement of accuracy in ROM_NDC estimates is observed for the latter events, due to RSN stations continuous multiplying, as well as to the increasing of events' magnitude. The shapes, amplitudes and spectral features of RSN signals were examined. A remarkably shape resemblance was observed for the signals generated by all five events, suggesting very similar explosive source type. Array processing techniques were applied for signal detection at Romanian seismic array, BURAR, in order to estimate the slowness information and to specifically characterize signals from nuclear explosions.

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