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IMS Stations Recording the Quarry Blasts Conducted on the Territory of the Former Semipalatinsk Test Site

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On the Semipalatinsk Test Site territory there are several mineral deposits at some of which the active mining is observed. The most blasts are conducted at Karazhyra coal quarry. Three IMS stations, Makanchi (PS23), Borovoye (AS057), Kurchatov-Cross (AS058), are recording these quarry blasts. The quarry-to-stations distance is 452 km, 668 km, and 68 km respectively. For 19 years of observation, about 2800 quarry blasts were recorded. The analysis of the routine processing results from the automated and interactive bulletin of Kazakhstan NDC showed that the field of obtained epicenters exceeds the quarry size. To understand the reasons of such scatter, the waveforms were processed in detail. For the processing and analysis of the waveforms, Geotool and DTK – GPMCC software were used. It was revealed that the azimuths values of different regional phases Pn, Pg, Sn, Lg differ from each other and have different dispersion. There are systematic deviations of azimuths for some phases. The clear dependence of the epicenter accurate measurement on energy (yield) of blasts was noted. The human factors influencing on the estimations accuracy were also found. The recommendations on processing were given to the KNDC analysts to improve location accuracy and discriminations of seismic events.

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Promotional text

Quarry balst activity on the territory of the former Semipalatinsk Test Site (STS)
Analysis of regional seismic phases and waveforms by Geotool and DTK – GPMCC software.

Oral preference format

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