

T3.3-O5. Creation of a high-resolution catalogue of mining explosions within the Russian platform using joint capabilities of seismic array Mikhnevo and IMS

The Institute of Geospheres Dynamics runs small aperture seismic array Mikhnevo (MHVAR) since 2004. We use the advantage of location and historical bulletins/catalogues of mining explosions recorded by Mikhnevo and data from seismic array AKASG (primary station of the International Monitoring System) in order to improve detection and identification of mining activity within the Russian platform. The data are obtained under Limited Access contract with CTBTO using virtual Data Exploitation Centre. Continuous data from MHVAR and AKASG are processed together using standard and waveform cross correlation techniques. The latter technique allows reducing the detection threshold by an order of magnitude as well as accurately locating and identifying mining explosions. To test the performance of cross correlation, we selected best sets of master events for Mikhailovskiy, Lebedinskiy, and Stoilenskiy mines and processed continuous data. Using the Principal Component Analysis for dimensionality reduction we produced synthetic waveform templates allowing faster data processing and improvement in resolution and sensitivity.

Primary author: KITOV, Ivan (CTBTO)

Presenter: KITOV, Ivan (CTBTO)

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