



ID: P5.2-471

Type: e-Poster

Use of the seismic moment tensor to recognize the genesis of seismic events in the East Baltic region

Thursday, July 1, 2021 11:15 AM (15 minutes)

Energy facilities and natural resource development are potential sources of anthropogenic impact on tectonic stresses in the earth's crust. The consequence of this can be provoked seismicity, which can be divided into induced seismicity and trigger seismicity. Provoked seismicity can be dangerous for the above-mentioned objects. However, signs of difference between tectonic and provoked earthquakes continue to remain relevant. The seismic moment tensor (SMT) based on waveform inversion is considered as a potential feature. The object of research is the sources of tectonic earthquakes and the alleged induced earthquake 2015/06/12 in the East Baltic region, located on the East European platform. The region is characterized by low seismic activity, a large number of quarry blasts and the presence of environmentally hazardous energy facilities. An induced earthquake of 2015/06/13 ("Red-light") ML 4.4 on the North American platform is also used as a test sample. The complex of analyzed parameters is supplemented by other characteristics of the earthquake source (seismic moment, moment magnitude, stress drop, source radius). The advantage of the method is the ability to assess the SMT for single stations. An estimate of the duration of the seismic process in the source can be a potential diagnostic feature.

Promotional text

The main contribution of the presentation is to search for perspective signs to distinguish between tectonic earthquakes and provoked earthquakes (induced and triggered) at East-European craton. One of the promising parameters of the SMT may be the duration of the seismic process

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Session Classification: T5.2 e-poster session

Track Classification: Theme 5. CTBT in a Global Context: T5.2 - Experience with and Possible Additional Contributions to Issues of Global Concern such as Disaster Risk Mitigation, Climate Change Studies and Sustainable Development Goals