



Mining Induced Seismic Event on an Inactive Fault

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Abstract

On 19 March 2013, a tremor shook the surface of Polkowice town where the Rudna Mine is located. This event, of $ML = 4.2$, was the third most powerful seismic event recorded in the Legnica Głogów Copper District (LGCD). Inhabitants of the area reported that the felt tremor was bigger and lasted longer than any other ones felt in the last couple of years. Analysis of spectral parameters of the records from in-mine seismic system and surface LUMINEOS network along with broadband station KSP record were carried out. The location of the event was close to the Rudna Główna Fault zone; the nodal planes orientations determined with two different approaches were almost parallel to the strike of the fault. The mechanism solutions were also obtained as Full Moment Tensor from P -wave amplitude pulses of underground records and waveform inversion of surface network seismograms. The results from the seismic analysis along with macroseismic survey and observed effects from the destroyed part of the mining panel indicate that the mechanism of the event was complex rupture initiated as thrust faulting on an inactive tectonic normal fault zone. The results confirm that the fault zones are the areas of higher risk, even in case of carefully taken mining operations.

Key words: focal mechanism, full moment tensor, mining induced seismicity.