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MINING INDUCED SEISMIC DOUBLETS AND MULTIPLET ANALYSIS – RUDNA MINE (POLAND) CASE STUDY

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Seismic events with similar focal mechanisms and similarity of Green's functions exhibit common waveform shapes on the same seismic station. The similarity of seismograms can be especially interesting feature in case of man-induced seismicity, since human activity causes fast changes in stress field on monitored area. This work is focused on potential mining-induced seismic doublets determination with use of possible similarity of shapes of their recordings. It was shown that for events which fulfilled the established criteria, waveform similarities are significantly higher than for other possible doublets. Using signals cross-correlation, we noticed crucial influences of Double Couple nodal planes' orientations on waveform similarities, although the focal mechanisms were characterized by very high non-Double Couple components. Finally we showed that human activity represented by mining is able to produce repeating induced earthquakes, with average cross-correlation coefficient up to 0.8.

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