



## **Source mechanism analysis of strong mining induced seismic event and its influence on ground deformation observed by InSAR technique.**

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On April 17th, 2015 a strong shallow seismic event M4.0 struck a mining panel in the Wujek-Slask coal mine, southern Poland. The event was widely felt, followed with rockburst and caused a strong damages inside mining corridors. Unfortunately two miners are trapped by tunnels collapse. Full Moment Tensor (MT) estimated with regional broad-band signals shows that the event was characterized with very high isotropic (implosive) part. Mining inspections verified the occurrence of a rockfall and floor uplift. Very shallow foci depth (less than 1000m) and collapse - like MT solution suggest that event could be responsible for surface deformation in the vicinity of epicenter. To verified this issue we used the Interferometric Synthetic Aperture Radar technique (InSAR). The InSAR relies on measuring phase differences between two SAR images (radarograms). The measured differences may be computed into a single interferometric image. i.e. an interferogram. Interferogram computed from two radarograms of the same terrain taken at different time allows detecting changes in elevation of the terrain. Two SAR scenes acquired by Sentinel-1 satellite (European Space Agency) were processed to obtain the interferogram covered study area (12.04.2015 and 24.04.2015). 12 days interval differential interferogram shows distinctive concentric feature which indicate subsidence trough. Subsidence pattern shows 1 cycle of deformation corresponding with about 2.5 cm subsidence. The InSAR solution support the reliability of very strong implosive MT part.