



The investigation the physical mechanism deformation process of surface subsidence above underground mining

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The purpose of this paper is to analyse the changes of rock mass properties at different depths following the surface subsidence caused by underground coal mining. The geophysical methods such as: long term resistivity measurements, strain tensor measurement and levelling of the surface subsidence were carried out above the advancing longwall face nearby Katowice-Kleofas coal mine. Both parallel and perpendicular to the face advancement measurements were performed. The results of the analysis of the resistivity sounding data showed the considerable influence underground coal mining on the deformation of the surface.

The strain rosette tensor and the vertical strain tensor shallow measurements showed direct deformations of subsurface rock layer. However, the strain measurements were carried out 2 meters beneath the surface. On the other hand the geoelectrical methods enabled the recognition of structural conditions and their changes at larger depths.

Obtained results of geophysical and levelling observations when correlated with the longwall advance proved that reasonable monitoring of selected site is possible. The qualitative deformation process model of subsurface rock layers was worked out on the basis of the carried out measurements which will in a future used for a quantitative description of the physical mechanism of the deformation process caused by underground mining.