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ASSESING THE POTENTIAL OF DIGITAL TERRAIN MODELS FOR MONITORING ADDITIONAL SUBSIDENCE OF COMMUNICATION EMBANKMENTS IN MINING AREAS – A CASE STUDY

OCENA MOŻLIWOŚCI NUMERYCZNYCH MODELI TERENU DO MONITOROWANIA DODATKOWYCH OBNIŻEŃ NASYPÓW KOMUNIKACYJNYCH NA TERENACH GÓRNICZYCH – STUDIUM PRZYPADKU

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Abstract

Today's technologies make it possible to capture certain phenomena that were very difficult or impossible to observe in terms of classical measurements. One of them is the so-called sinking of embankments. It is common in mining areas. It consists in the additional subsidence of the embankments into the ground, above the value of the lowering of the adjacent area. It takes place primarily in the zone of horizontal tensile deformations. The paper presents the results of comparative DTM (Digital Terrain Model) analyzes from 2001, 2014, 2018 and 2021. Their aim was to assess the usefulness of DTM data for monitoring the additional sinking of the communication embankment on the example of the northern bypass of Bytom. The authors analyzed digital terrain models generated in the process of rasterization of data from ALS (Airborn Laser Scanning).

Keywords: mining subsidence, digital terrain model, communication embankments, post-mining areas

Streszczenie

Dzisiejsze technologie pozwalają wychwycić pewne zjawiska, które w ujęciu pomiarów klasycznych były bardzo trudne lub też niemożliwe do zaobserwowania. Jednym z nich jest zjawisko tzw. tonięcia nasypów. Występuje ono powszechnie na terenach górniczych. Polega na dodatkowym zagłębianiu się budowli w podłoże, ponad wartość obniżenia terenu przyległego. Ma ono miejsce przede wszystkim w strefie poziomych odkształceń rozciągających. W pracy przedstawiono wyniki analiz porównawczych NMT z lat 2001, 2014, 2018 i 2021. Ich celem była ocena przydatności danych z NMT do monitorowania dodatkowego zagłębiania nasypu komunikacyjnego na przykładzie północnej obwodnicy Bytomia. Autorzy poddali analizom numeryczne modele terenu wygenerowane w procesie rasteryzacji danych pochodzących głównie z lotniczego skanowania laserowego ALS.

Słowa kluczowe: osiadania górnicze, numeryczny model terenu, nasypy komunikacyjne, tereny poeksploatacyjne

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