



Modeling and visualization of spatial displacement and deformation of the ground surface in the local geodetic network using geographic information systems

Piotr Grzempowski and Wojciech Milczarek

Wroclaw University of Technology, Wroclaw, Poland (piotr.grzempowski@pwr.wroc.pl)

Geodetic measurements provide precise data about the movements of discrete points of the research area. For the development of a mathematical model of displacements selected interpolation method with the assumption of continuity and discontinuity in the faults zone have been tested. Analysis of selected methods for modeling ground surface deformation and visualization in 3D using a geographic information system (GIS) have been also taken into consideration.

For interpretation and visualization of the local geodynamical results module of data integration have been created. That module manage data structure and data exchange between expert systems and GIS. The scope of the integrated data includes the results of geodetic measurements (GPS, precise leveling), geological and hydrogeological data and the data from outside expert systems processed using advances methods not available in GIS (processing of GPS data, MES analysis, data clustering and other). Data is collected and visualized in GIS. The application of geostatistical methods for interpretation of the geodetic data in relation to factors influencing on ground surface deformation.