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Artificial neural network in analysis of vertical movements of the ground surface in Cainozoic deposits areas

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The geodynamic research of the Middle Odra Fault Zone in Lower Silesia (Poland) started in 2007. Previous geodynamic researches, carried out in SW Poland, have been conducted in areas characterized by little thickness or lack of Cainozoic sediments (Sudety Mts., Fore-Sudetic Block). Geodynamic network points were set-up on crystalline rock outcrops and deformations caused by groundwater factors had no influence on results of these measurements. The Middle Odra Fault Zone is covered by, up to 300 m thick, Cainozoic deposits, in which many factors cause deformations and vertical movements of the ground surface. Deformation analysis of the Cainozoic layers is necessary to assess, geodetic and satellite GPS measurements based, activity of the Sub-Cainozoic bed. In the paper artificial neural network applications to classify sub-areas of deformations are presented. These are based on analysis of displacement vectors of measured points, geological, geotechnical and groundwater conditions and other potential factors influencing deformations of the ground surface. Preliminary analyses have been made for the area of Wroclaw City and its surroundings which constitute part of the Middle Odra Fault Zone.