

National Centre for Diagnostic of an Earth Surface Deformation on the Area of Slovakia

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Abstract: The area in Slovakia is 49 035 km². Its surface consists mainly of Carpathian Mountains, which has its own structure and dynamics of movement caused by the global and local motions. Global movement is generated by a horizontal movement of the African continent and vertical movement in Scandinavia. Local dynamics of the earth's surface is reflected local ground motion in the form uplift and subsidence. Global and local motions are integrated into a single action that is taken into account when designing and operating large buildings works. For existing activities of Department of Theoretical Geodesy in monitoring of geodynamical phenomena using GNSS techniques and repeated measurements of absolute gravity formulated a project called the National Center for diagnosis deformations of the earth surface in the territory of Slovakia (Mojzes, 2010). The project is financially supported at 95% of the EU and 5% of the STU Bratislava and will be addressed during the three years from 12/2010 to 11/2013. The solution is based on the monitoring network, which will include 9 permanent GNSS points. Measurement results will be analyzed and visualized for the practical needs in the form of horizontal and vertical changes of the Earth's surface. In addition, satellite monitoring will be used to determine the water vapor content over the territory of Slovakia. Near the GNSS points will be monument absolute gravity points to monitor changes in gravitational acceleration, which enable determine the trends of vertical changes in the earth's surface. The measured geometric and physical parameters changes will be analyzed using special software and on the basis of these risk areas will be determined risk zones for practical applications of construction plans, transportation of energetic materials and transfer energy in Slovakia. Project results will contribute significantly to increase the accuracy and optimal

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monitoring of local changes of Earth surface. The project will contribute significantly to the reliability and objectivity of the monitoring results of changing the earth's surface will be sent in the local built for nuclear and hydroelectric power plants, transport facilities which will bring significant cost reductions for the establishment of local monitoring network. The presentation will be focused on presenting the basic directions of the project.

Key words: GNSS observation, gravity observation, deformation of Earth's surface

References

Mojzes M., 2010: Request for grant “ National Centre for Diagnostic of an Earth Surface Deformation on the Area of Slovakia”, Bratislava 2010, 63 p.