

Study and Analysis of Horizontal Component Measurements of Mountain's Land Sliding

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Abstract

Studying the land sliding in mountain's excavations becomes very important when the excavation is relatively deep. In this research, we have measured the sliding of a mountain's mass caused by excavation in Bludan area in Syria. Both sliding components dx and dy were measured periodically in order to determine the translational and rotational movements. Geodic network composed of concrete posts was set up. This network was necessary due to the valley's deepness. The Theodolite was positioned at these posts during the measurement's cycles .

The calculation of the rotation centers of the two benchmark systems: ($R_1, R_2, R_3, R_4, R_5, R_6$) and (R_8, R_9, R_{10}, R_{11}) was based on the calculation of the linear regression lines related to the translations dl and the arcs S facing the azimuths. A certain regression line was calculated for each benchmark system.

The analysis of the measurements showed that both systems were rotating in opposite directions westwards. Depending on the movements (dl) measured during four months measurements period, both monthly linear and angular velocities of each benchmark were calculated.

Based on our results, we have given some recommendations concerning deep excavations down a mountain mass.

Keywords: Mountain land sliding, Linear regression, Rotation's center of bench marks system, Posts steadiness, Rotation axis of bench marks system.

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