



Comparison of applicability of different adjustment methods for monitoring of deformation in natural and artificial structures

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Monitoring and detecting of deformations of natural and artificial structures can be carried out by various instrumental and statistical methods. In this study, where data was collected from November 1997 thru March 1998 using robotic total station and prisms, two major statistical adjustment methods were implemented: Helmert Transformation (HT) and Kalman Filtering (KF). Data processing is carried out three times: using Leica's APSWin software to implement HT, and using author-developed program to implement HT & KF. The importance of apriori factors and covariance matrices has been clearly apparent. The three methods result in different values due to eight reasons, such as differences between methods of calculation of average cycles and operator-dependent decisions over tolerances of parameters. The biggest difference among deformation values, taking into consideration the vector direction, is almost 30 mm. Keeping in mind that the required accuracy of result depends on the nature of deformation, it has been concluded that both adjustment methods is applicable in the process of deformation monitoring.