



Implementation of Kalman filtering technique to monitor deformation in natural and artificial structures in the absence of dynamical information

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Detecting, monitoring and modeling 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, Kalman Filtering Technique (KFT) is implemented to monitor such deformations, dynamically, with no priori information regarding the dynamics of the problem. While it is commonly known that the dynamical model incorporated into such KFT algorithm has significant importance due to its dictation of the transition matrix, this study shows that there is no need to have such model to be exact due to the existence of system noise vector. The model of random-walk has been implemented successfully and is recommended to be used where little or no dynamical information is present regarding the problem in hand.