Point-Based Sensitivity Analysis in Geodetic Monitoring Networks

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The sensitivity analysis of geodetic monitoring networks is realized mainly to determine the minimum detectable displacements or to derive, if the corresponding network is capable of detecting the expected displacements with preassumed error probabilities. In this study, minimum detectable displacements for geodetic monitoring networks are examined as well as how point-based sensitivity is impressed by datum constraints which are supplemented to the adjustment model. A horizontal control network is used to study this effect. Our experiments on this network indicate that the furthest point to the reference points, which contribute to the datum definition, yields the largest magnitude of minimum detectable displacement. That is to say the closest point to the reference points owns the lowest minimum detectable displacement. Furthermore, the displacement magnitude reduces when the number of reference points are increased in geodetic monitoring networks.