

Reliability analysis in linear models

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Abstract

In geodetic science, reliability measures are used to determine the potential of detecting any outliers in the respective observations ("internal reliability"), and to limit the impact of any undetected outliers on the estimated parameters ("external reliability"). Here we study the change of these reliability measures, due to modifications in the experimental design, within various linear models that include the rank-deficient Gauss-Markov Model with and without effective constraints, and the so-called Gauss-Helmert Model. We shall conclude this study with some examples from photogrammetry, resp. "computer vision", where sometimes up to 15% of the automatic measurements may be affected by outliers or blunders.