

**A NEW APPROACH FOR THE DETECTION OF MULTIPLE OUTLIERS BASED ON
LIKELIHOOD RATIO TESTS**

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One of the main challenges in the quality control of geodetic measurements is the reliable identification of multiple outliers. Here, it is assumed that outliers are observations contaminated by gross errors (blunders), following the statement that in Geodesy, outliers are most often caused by gross errors and gross errors most often cause outliers. Within this context, the goal of this paper is to present a procedure designated here as Sequential Likelihood Ratio Tests for Multiple Outliers (SLRTMO). To verify its performance, a levelling network was simulated involving one, two, and three (simultaneous) outliers. The Data Snooping (DS) procedure was also applied in these numerical simulations. Results showed that both methods are efficient for the case of a single outlier, but the DS did not maintain its efficiency in the case of multiple outliers as the SLRTMO did. Furthermore, the maximum number of outliers to be considered has to be defined according to the redundancy of the network so as to ensure the performance of SLRTMO.