

ON USING QA/QC TECHNIQUES FOR LIDAR-IMU BORESIGHT MISALIGNMENT

A. Pothou,^{*}, C. Toth, S. Karamitsos, A. Georgopoulos
Laboratory of Photogrammetry - (apothou, drag)<@central.ntua.gr
Laboratory of Higher Geodesy - karamits@central.ntua.gr
School of Rural & Surveying Engineering, National Technical University of Athens,
Greece
Center for Mapping – toth@cfm.ohio-state.edu
The Ohio State University, Columbus, USA

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LiDAR is an effective technology for obtaining detailed and accurate terrain models from airborne platforms. High-performance integrated GPS/IMU systems provide the navigation data for the LiDAR data acquisition platform, therefore, the proper calibration of this Mobile Mapping System (MMS) is a must to determine the accurate spatial relationship of the involved sensors. This work investigates the determination of the misalignment between the IMU body frame and the LiDAR frame which is called boresight misalignment. The misalignment is determined by an adjustment during an evaluation of using a QA/QC technique (Quality Assurance/Quality Control). The processing scheme of the algorithm is based on the least squares estimation principles, and includes testing the validity, accuracy, and precision of different statistical tests for outlier detection in positioning and attitude data. In this paper, the theoretical model, results based on simulated data and a performance analysis obtained from the implementation of the algorithm, are presented. The prototype system is implemented in a Matlab environment.