

The Effect of Datum Constraints for Terrestrial Laser Scanners Self-Calibration

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SUMMARY

Similar to other optical and electronic instruments, data obtained from terrestrial laser scanners (TLSs) can be impaired by errors coming from different sources. Thus, a calibration routine is crucial for TLSs to ensure the quality of the data. Self-calibration is a common camera calibration procedure used in photogrammetry measurement which has been adapted for TLSs application. According to photogrammetry approach, there are several conditions needed be fulfilled for the calibration process especially about network configurations and datum constraints. However, network configurations applied to TLSs self-calibration are quite different compared to photogrammetry. Regarding the datum constraints, the theory states that the selection of either inner or minimum constraints can cause different effect on parameter correlations. Due to this argument, this study investigates the possible effect of datum constraints selection in TLSs self-calibration. Three comparisons were carried out between results obtained from inner and minimum datum constraints. Applying graphic and statistical approaches, the differences were analysed and the results indicated that both datum constraints could give similar outcomes and parameter correlations.