

TEST FIELD FOR AIRBORNE LASER SCANNING IN FINLAND

E. Ahokas*, H. Kaartinen, A. Kukko, P. Litkey

* Department of Remote Sensing and Photogrammetry, Finnish Geodetic Institute, Geodeetinrinne 2, 02430 Masala, Finland –
ero.ahokas@fgi.fi

Commission I

KEY WORDS: LIDAR, Calibration, Mobile, Quality, Test field

ABSTRACT:

Airborne laser scanning (ALS) is a widely spread operational measurement tool for obtaining 3D coordinates of the ground surface. There is a need for calibrating the ALS system and a test field for ALS was established at the end of 2013. The test field is situated in the city of Lahti, about 100 km to the north of Helsinki. The size of the area is approximately 3.5 km x 3.2 km. Reference data was collected with a mobile laser scanning (MLS) system assembled on a car roof. Some streets were measured both ways and most of them in one driving direction only. The MLS system of the Finnish Geodetic Institute (FGI) consists of a navigation system (NovAtel SPAN GNSS-IMU) and a laser scanner (FARO Focus3D 120). In addition to the MLS measurements more than 600 reference points were measured using a Trimble R8 VRS-GNSS system. Reference points are along the streets, on parking lots, and white pedestrian crossing line corners which can be used as reference targets. The National Land Survey of Finland has already used this test field this spring for calibrating their Leica ALS-70 scanner. Especially it was easier to determine the encoder scale factor parameter using our test field. Accuracy analysis of the MLS points showed that the point height RMSE is 3.5 cm and standard deviation is 2 cm. Our purpose is to measure both more MLS data and more reference points in the test field area to get a better coverage. Calibration flight heights are planned to be 1000 m and 2500 m. A cross pattern, SouthWest-NorthEast and NorthWest-SouthEast, will be flown both in opposite directions.

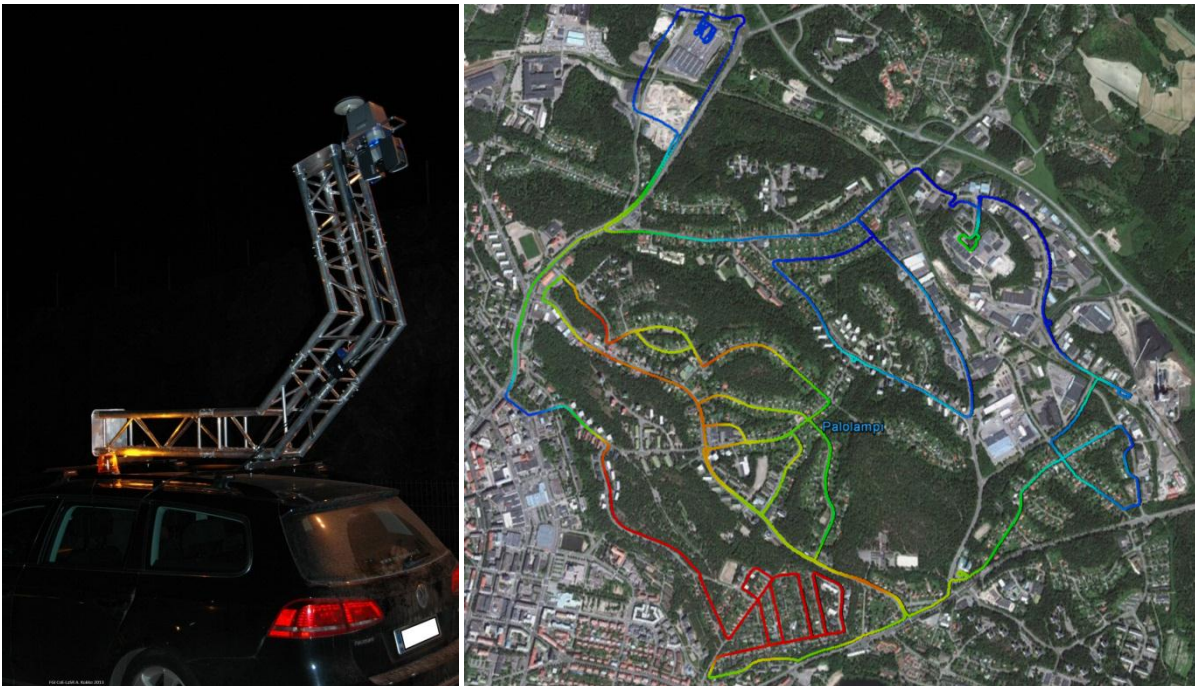


Figure 1. The Akhka R2 MLS of the FGI (left) and colored MLS trajectory in the city of Lahti (right, background image: Google Maps).