CORRECTION OF THE INCERTITUDES OF MEASURED POINTS BY LASER SCANNING ON THE PHYSICAL SURFACE

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ABSTRACT:

The up building of the Airborne Laser Scanner (ALS) sensor depends on the operation of three devices: a light beam transmitter/receiver, a dual frequency GPS receiver and the IMU. However, there are two relevant aspects in the laser sensor measuring process. First of all, the presumption of the synchrony of the devices, which is only theoretical, as the transmission rates are distinguished for each of the involved elements. Secondly, the error of interpolation caused by the discrepancy between the ALS emitted pulses and the frequency of the signal emerged from the GPS receiver. The paper reveals the procedures for minimizing the influence of the incertitudes resulting from the operational problems of the synchronization and interpolation of the sensor. It estimates the parameters and possible controlled method of the spot on the block of simultaneous adjustment of strips resulting from the ALS technology – according to the Helmert 3D transformation using the Method of the Least Squares. The parametric model is adopted to minimize the influence of the incertitudes which affects the original measurements with ALS, for all the observations are obligatorily submitted to the same local reference. Field activities with planned distribution of points in the interior and in the strip edges are described, particularly in areas of lateral overlapping of the-strip block of the aerial surveying. The results from the parameters of the simultaneous adjustment model in different places of the block are detailed and it indicates the efficiency of the method when comparing the point's coordinates, free of distortions.

TOPIC: Lidar and laser scanning
ALTERNATIVE TOPIC: Remote sensing applications