TERRAIN ECHO PROBABILITY ASSIGNMENT BASED ON FULL-WAVEFORM AIRBORNE LASER SCANNING OBSERVABLES

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ABSTRACT:

Airborne laser scanning (ALS) has become a widely used method for data acquisition in various fields of engineering over the past few years. The latest generation of commercially available ALS systems, the so-called full-waveform ALS systems, are capable of detecting the whole backscattered waveform, which needs to be analysed in post-processing in order to detect the individual echoes. During this signal processing step additional observables, such as the amplitude and the width of the backscattered echo, are derived. The hereby produced 3D point cloud holds additional information about the radiometric and geometric characteristics of the objects within the footprint area of the laser beam. In this paper point cloud samples of different ground cover are examined regarding their distribution of amplitude and echo width. Subsequently, a method for employing these observables for the assignment of probabilities, whether an echo is more likely to stem from terrain or not, is presented. These probabilities can also be interpreted as individual weights that are assigned to the single points and can be used in subsequent digital terrain modelling (DTM) algorithms for a derivation of more accurate DTMs.

TOPIC: Lidar and laser scanning
ALTERNATIVE TOPIC: Lidar and laser scanning