



Airborne Laser Scanning - Examples for operational Application in Hydrology

N. Pfeifer

alpS - Natural Hazard Management, Innsbruck, Austria (norbert.pfeifer@uibk.ac.at)

The operational aspects of acquiring laser data and examples for its operational, i.e., standard use will be presented. First the data acquisition will be detailed, which offers, amongst others, the advantages of being directly 3D, highly accurate and able to sample ground elevations below forest canopy. Before the data can be used for applications in hydrology, a classification into ground points and off-terrain points, e.g. on vegetation, house roofs, or power lines, has to be performed. An overview on filter algorithm will be given. Through their development the filter algorithms shifted from i) point based, investigating the local neighbourhood of a point, to ii) surface based, starting from a ground surface model and adapting it with respect to the given point cloud, and finally to iii) segment based, where points are grouped into homogeneous regions which are then classified into ground and object. The examples for demonstrating the maturity of airborne laser scanning, which became operational in the 1990ies, are taken from the field of hydrology, comprising flooding simulation, glaciology, water level decision, and avalanche simulation. In these cases the digital terrain model (DTM) has to provide a resolution between 1m and 5m, with a vertical accuracy around 5cm to 20cm. Concentration is not put on the methodology of the respective field, but on the advantages laser scanning offers over other techniques (e.g., passive optical remote sensing in the visible spectrum) and the aspects that make it operational. As it will become clear, the reasons for choosing this technology are versatile. For some applications, laser scanning is an enabling technology, whereas in other fields the economical advantages are dominating.