Estimating Tree Volume with Terrestrial Lidar Data

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Abstract

This study utilized a terrestrial LIDAR system, Leica HDS3000 laser scanner, to acquire data about a forest stand. To facilitate modeling and accurate measurement, a CAD system was used to process the raw data, and a three dimensional model of the forest stand was built from the point clouds. Furthermore, cross-sections of trees at various heights were extracted from the point clouds and their diameters were measured. Subsequently, the volume of trees can be estimated from the diameters measured at different heights. The results indicate that LIDAR system can be used to obtain highly accurate data very efficiently. The laser scanner data are valuable for estimation of various tree parameters such as height, crown size, diameter, basal area, and volume.