

Relationship between LiDAR data and height and density of trees in Izumozaki district, Niigata prefecture

OKATANI, Takaki^{1*}, Kousei Otoi¹, NAKANO, Takayuki¹, KOARAI, Mamoru¹

¹GSI of Japan

Hazard like landslide is suspected to be affected by land cover besides landform and geology from previous studies.

LIDAR survey measures length from aircraft to the surface of the earth by traveling time of laser between transmission and reception. The survey can also obtain values relating to height and density of trees. Recently, dense observations having been performed in Japan.

This study verifies relationship between LIDAR data and height and density of trees in Izumozaki district in Niigata prefecture, aiming at establishing new land cover classification method involving information of height and density of trees as the information is thought to contribute to evaluation of possibility of occurrence of landslide hazards and to be calculated by LIDAR data.

The study showed that estimated tree height by subtracting DTM from DSM is approximately consistent with actual tree height and density of trees might be estimated from distribution of differences between DSM and DTM as the small differences are often observed in sparse area.

By the way, LIDAR data were affected by type of trees as the data were obtained in late October to early November. In that season, DSM random point data were seen near the surface of the earth in magnolia trees and Prunus sargentii trees area as these trees lost leaves earlier than other deciduous broad-leaf trees such as Quercus serrata trees and chestnut trees. This shows that LIDAR data are strongly affected by degree of loss of leaves, and understanding of the degree of loss by aerial photos or other sources is very important when assuming density of trees from LIDAR data.

Keywords: LIDAR Data, Height and Density of Trees, Izumozaki District

