The comparative study between UAV digital image and Aerial Lidar data for forest height

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Abstract: The tree height (HGT) is very important for forest biomass1 and management. In 2013, the Korea Forest Service has answered the results of the questionnaire poll on the need for more than 95% improvement to tree height and old class accuracy. However, improving the attribute value for the stand required much money and skill. Recently, Lidar, one of the most progressive technologies, has been widely used for estimating the HGT and diameter at breast height (DBH) at forest stand and provides detailed information at Aerial Lidar (AL) multiple beam from bottom to crown. And, Unmanned Aerial Vehicle (UAV) image can made Point Cloud, but it is difficult to detect ground point unless it is a coniferous forest in winter. The basic data of this study is based on the GSD 0.25m aerial photographs used in Rep of Korea. The aerial Lidar has a density of about 20cm and UAV resolution is GSD 0.08m. Therefore, we obtained a correlation value for the acquired values of image based UAV, AL, fieldwork, and 3point methods. In this study, the goal of this study is to obtain effective and economical HGT. For this purpose, we derived Digital Terrain Model (DTM), Digital Surface Model (DSM) and finally canopy height model (CHM) from AL & UAV. We compared the values of the forest type map attributes of 1: 5,000 scale, which are currently used in the Rep. of Korea. We also compare the accuracy of each standard metric.

Keywords: HGT, Aerial LiDAR, UAV, Forest type map, DBH