Paper title:Land slide Monitoring by　LiDAR and digital camera with band path filters.

LiDAR (Light Detection And Ranging) can observe land surface and any objects on the earth.The topographic analysis using LiDAR is carried out now in various research organizations.Geomatics Laboratory in Kochi Univercity of Technology is developing method of landslide monitoring using LiDAR.Landslide area is covered by vegetation which should be eliminated on LiDAR data. Vegetation has a characteristics which is high reflectance in near infrared band.The near infrared band can be detected by digital camera with band path filters,Normalized Differential Vegetation Index (NDVI) can be calculated.Therefore,objective of this study is vegetated area that will be eliminated from LiDAR data using digital camera.Firstly,NDVI image must be generated by digital camera image using three band path filters.Secondly,NDVI image and LiDAR data must be unified using control points.Thirdly,the vegetated area will be eliminated from LiDAR data.The study area was located in Choja Kochi,Japan.The landslide is moving 2～3cm a year.On July 23th 2013,LiDAR measurement was carried out and digital camera image was taken.

The result showed that LiDAR data and digital camera image was unified successfully using GCPs.However,NDVI image had not enough results because of any reasons.For example,sensitivity in near infrared band was very low because general digital camera

has near infrared band cut filter.Now,special camera without infrared band cut filter is prepared.Moreover.there are many direct reflectances from the sun in the images.The digital camera images must be taken under the sun is located backward.