

Estimation method of land cover change area for urbanized area by using coherence data of SAR

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The objective of this study is to propose the estimation method of land cover change area that combining optical sensor data and coherence data, and to propose the application scope based on the estimated results of land cover change area caused of landslides and human activities.

Recently, due to the impact of the recent global warming, causing the unexpected torrential downpour and typhoon that increase the possibility of flood disaster and landslides. Therefore, it is very important to grasp the disaster situation immediately. In this situation, synthetic aperture radar (SAR) is not easily affected by weather and time than the optical sensor. It can grasp the disaster situation effectively. Currently, interferometric SAR (InSAR) has been applied to a crustal movement and landslides. InSAR is a surveying technology for measurement of crustal movement and generation of digital surface model by interfering with the SAR data observed in two periods. In this study, we focus on the coherence data that is one of the intermediate data of InSAR. Coherence data is the absolute value of the complex cross-correlation of the two SAR data, while coherence data is related to corresponding land cover changes. From these, we propose the estimation method of land cover change area combining optical sensor data and coherence data. The results of this study is as follows;

- (1) The accuracy of the land-cover change region using the proposed method was about 60% to 80% when using a classification map, about 50% to 90% when using the land use. In addition, it was suggested that it is possible to capture the land cover changes involved in the agricultural cycle such as rice and sweet potatoes.
- (2) It is available to apply in different purposes such as estimation of the damage area and selection of research candidate by devising the window size of coherence and parameters of the aggregation and sorting.
- (3) The proposed method tended to estimate that land cover changes larger than the land cover changes obtained by visually reading, and there is a high possibility of being capture the change that cannot be read visually such as differences in water content.
- (4) The estimation accuracy of the land cover changes area was largely affected by the resolution and the number of categories of land cover changes.
- (5) It was difficult to estimate the land cover change on the growth of vegetation such as forests, shrub forests and rice.
- (6) It was impossible to estimate the land cover changes in some area where data was missing such as the sea.

Keywords: Coherence, Land cover, Classification map