Detection and Calculation of Peatland Subsidence in Indonesia by using Interferometric Synthetic Aperture Radar (InSAR)

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ABSTRACT: Peatlands are a kind of wetlands with a thick water-logged organic soil layer storing large amount of carbon. They play important roles not only as the function of carbon sink but also as the home of animals and plants including many endangered species. In recent years, the drainage or the fire for agriculture has been destroyed peatlands and it causes peatland subsidence.

In Indonesia, one of the largest peatland owners, peatland subsidence appears frequently and farmland near the seashore suffers serious floods caused by tide or heavy rain during the rainy season. In addition, peatland subsidence leads to greenhouse gas emissions and accelerate global warming. Thus in Indonesia, under such circumstances, the conduct of appropriate land management is an urgent issue.

This study aims at detecting and calculating peatlands subsidence by processing Interferometric Synthetic Aperture Radar (InSAR). By making use of InSAR properties, it comes to be possible to measure land surface deformation at a centimeter level.

As concrete methods, SAR data (such as ALOS/PALSAR, ALOS-2/PALSAR-2) that is not influenced by cloud cover and the field data are used together. Then, the distribution of the peatlands subsidence amount and the peatlands subsidence velocity are calculated spatially. Finally, as a result of this study, the relationship between the amount and the emission of CO_2 is investigated.

Proposed presenter: Sho TSUNODA
Preference of presentation: Oral