ESTIMATION OF THE CO2 EMISSION FROM THE PEATLAND OF CENTRAL KALIMANTAN USING THE PALSAR INTERFEROMETRY

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Abstract

Emission of the CO2 from the Indonesian forest is mainly composed of the deforestation, forest degradation, and the peat land subsidence. Peat land subsidence of Indonesian islands represented by the Central Kalimantan is induced by the global warming and the resultant chemical processes at the peat land emit the CO2 to the air. The measurement of a relationship between the subsidence speed and the CO2 emission amount and the two dimensional subsidence speed measurement using the PALSAR interferometry were applied to estimate the gross amount of the CO2 emission at the test site of the Central Kalimantan. In the presentation, we will show the estimated value of the CO2 emissions. PALSAR and interferometry was introduced in [1].

Availability of the InSAR technique for the peat land was evaluated, first, by checking the quality of the interferometric coherence, then the value on the subsidence by InSAR was compared with the position of the peat land surface that was obtained as an length along the iron pipe which is piled to the solid ground of around 3 meter below the surface. We have used the in total seven PALSAR image pairs for measurement of the subsidence al of which are referred to the July 9 2007. We obtained the ground control point at three areas, Vegetation area (KV), Fire scared and regrowth forest (RF), and Forest region (FT). RMS errors of these areas are, 0.79 cm for KV, 2.24 cm for RF, and 3.51 cm for FT.

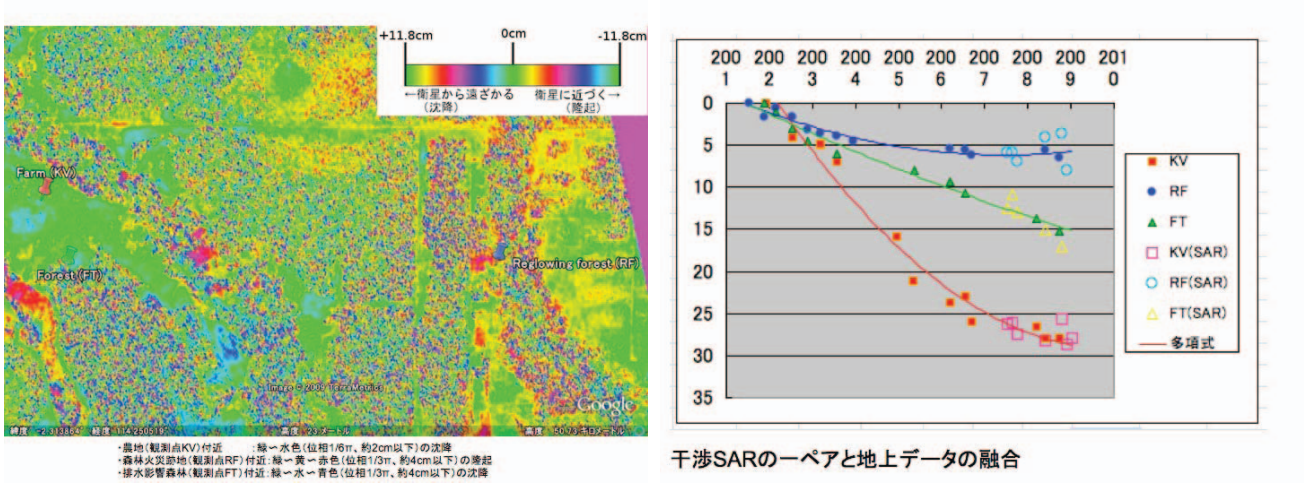

Fig.1 Test site in the Central Kalimantan (left) and the relationship between the subsidences's (InSAR and ground truth data comparison)

Conclusions

In this study, we succeeded to measure the InSAR sensitivity on the subsidence speed at the peat land area in the central Kalimantan. RMS error of the InSAR measurement and the ground truth data range from 0.79 to 3.51 cm. These variations depend on the coherence of the target areas. Use of the ground truth on subsidence speed can estimate the total emission of the CO2 to the air when using the InSAR subsidence data.

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References

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