Studies of superficial deformations with InSAR in RCEP, DPRI, Kyoto University

Manabu Hashimoto[1]; Yo Fukushima[2]; Fumio Ohya[2]

[1] DPRI, Kyoto Univ; [2] DPRI, Kyoto Univ.

We conducted 'The study of evaluation of disaster potential by the detection of superficial/ crustal deformations using InSAR such as ALOS/PALSAR' supported by the DPRI's Special Fund in 2006. The target of this study is to develop evaluation methods by detecting superficial displacements due to earthquakes, volcanoes, landslides etc. with InSAR and improve our research potential. For example, it is an important theme to examine to what extent GPS or continuous crustal deformation observations, which are observations at points, represent regional displacement field. Furthermore, we tried to detect deformations due to several geological/geophysical phenomena to increase the number of examples. Here we report the preliminary results.

First, we analyzed RADARSAT and JERS-1 images to detect superficial displacements in Kyoto-Osaka and Miyazaki regions where most of our GPS and continuous crustal deformation observation sites are distributed. We used Sigma-SAR developed by Shimada(1999) to analyze 9 scenes obtained with about 1 month interval in 2005. Although fringes due to orbital error are not fully removed, we recognize NE-SW trending fringes in the Osaka plain in several pairs. Furthermore we can observe a N-S trending boundary of fringes there in pairs taken in summer. It is interesting to investigate the relationship between these fringe patterns and subsurface structure of the Osaka plain. We will further examine these data.

Secondly, we analayzed JERS-1 images in the Miyazaki area, before and after the 1996 Hyuganada earthquakes. Since there are still fringes due to orbital errors, coseismic or postseismic deformations are hard to be recognized. However there are local spots of deformation in the Miyazaki plain, Miyakonojo and Hitoyoshi basins, and the Kokubu area. They may be local subsidences.

We have been conducting the analysis of images (ALOS and Envisat) before and after several phenomena such as Kilauea volcano in Hawaii, mud-volcano in Indonesia, 2006 Mozanbique earthquake, and 2006 earthquakes in southern Taiwan, etc. Fukushima et al.(2007) reports deformations due to mud-volcano in Indonesia in detail. We are going to briely report their preliminary results.

Shimada, Verification processor for SAR calibration and interferometry, Adv. Space Res., 23, 8, 1477-1486, 1999.