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Crustal Movement Observation in Active Volcanic Region (Kamchatka, Central America, and Indonesia) using ALOS/PALSAR

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Japanese earth observation satellite ALOS (Advanced Land Observing Satellite) was launched on January 24, 2006, and has been operated by Japan Aerospace Exploration Agency (JAXA). ALOS operation has been going well and a lot of data from all over the world was accumulated using three sensors (PRISM, AVNIR-2, and PALSAR). Because PALSAR (Phased Array type L-band Synthetic Aperture Radar) is active microwave sensor, it can observe earth surface (targets) at anytime of the day or night, and under almost all weather conditions. And PALSAR data can be applied to Differential Interferometric SAR (DInSAR) technique to detect crustal movement. DInSAR technique enables us to obtain spatially detailed crustal movement with high accuracy, and to understand volcanic activities.

In the Kamchatka Peninsula at the far east of Russia, there are many active volcanoes, for example Kliuchevskoi, Shiveluch, and potentially active volcanoes. We tried to detect crustal movement in whole area of the Kamchatka volcanic region using PALSAR/DInSAR technique. Actually, we are suffer from snow cover in winter season and long baseline between two acquisition time due to the high latitude of the target area, which usually destroy the coherence and bring difficulties into DInSAR processing. However, accumulation of PALSAR data for 5 years enables us to make DInSAR observation over Kamchatka peninsula, and we could detect crustal movement associated with volcanic activity in Gorely volcano. Also in Indonesia and Central America volcanic regions, there are so many active volcanoes, e.g. Merapi volcano or Arenal volcano, and we tried to detect crustal movement from extensive PALSAR/DInSAR observations.

Keywords: ALOS, PALSAR, DInSAR, crustal movement, volcano