

## Crustal deformation around Ontake volcano detected by GPS observation

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We detected slight crustal deformation around Ontake volcano started at December in 2006 and revealed a source model by using GPS observation.

In Ontake volcano, volcanic earthquakes began to occur beneath the summit at late December in 2006, and the seismicity has been a little active since then. By GPS observation, we found slight extensions of the baseline length, preceding this seismic activity. It was the first time that a deformation associated with volcanic activity was observed in Ontake volcano by GPS network.

Several GPS sites of GEONET which was installed by GSI show small inflation around Ontake volcano. 3 GPS sites on the volcanic body, installed by JMA, also disclosed larger inflation, but extensions of the baseline length can be as small as 1 cm at most. Each baseline length has extended at a constant rate since December, 2006.

In order to the baseline analysis with coordination between two GPS networks, which were installed by JMA and GSI, we followed the procedure as below. In order to carry out the correction for the ionosphere, first we made the mapping model every day, using the double-frequency GPS data which received at only one receiver of JMA network and at 3 receivers of GEONET. And then we did single-frequency analysis for JMA network data. In the next place we did double-frequency analysis between the double-frequency GPS site of JMA and one of GEONET nearest to the site of JMA. The baseline analysis has carried out by using the Bernese GPS software version5.0.

This coordinated GPS dataset made estimation of a pressure model possible by distribution of horizontal displacement. The most suitable pressure model was proposed as the 2 sources model. One pressure source was presumed as the tensile crack standing 3 km deep beneath the volcanic body with NS strike. The other was estimated as the point source at sea level just beneath the summit. Amounts of volume increase were 5.1 and 0.4 million cubic meters respectively. Those were presumed to the magma intrusion and the inflation caused by the hydrothermal activity.