

GPS campaign observation at Jodo-daira in northern Alps, central Japan

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We have performed GPS campaign observation at Jodo-daira of Tateyama Mountains in northern Hida mountain chain, central Japan. From the result of about 10 years observation, The JODO observatory have uplifted from the fixed point in Toyama Plain.

In present day, there are about 1000 points of GPS observatories by Geographic Survey Institute in Japan. The finding of Niigata-Kobe Tectonic Zone (NKTZ) is example of the result of these observations (Sagiya et al., 2000). But the distribution of observatories are influenced by geographical factors, especially there are blanks of observation in mountain range.

We have performed GPS campaign observation at Jodo-daira (2847 m) in the northern Hida mountain chain, central Japan, since 1996. This observatory (JODO) is located in important area from the view point of tectonics, because the observatory is located in the NKTZ, and the Northeastern end of Atotsugawa Fault System. And also, two different trends of big structures (NKTZ and Fossa Magna) are crossing in the west of JODO. Tateyama observatory is the nearest site of GEONET. But the start of observation is 1998 at the site, and there are failures of observation at 2000. The Tateyama observatory is located on the andesite of Tateyama (Midagahara) Volcano, although the JODO is located on granite rock.

Using GPS receiver and antenna are Ashtech GP-R1Z-12 and GeodeticIII The observation is performed 1 or 2 times in year, and one observation is for about 3 or 4 days. Especially, we have observed 2 times (summer and autumn) in every year since 1999, to considered annual deformation.

We use 6 GEONET data and 19 IGS data with GAMIT software version 10.2 in the analysis of JODO observation data.

If the Toyama observatory of GEONET was fixed, JODO have been moving toward West-southwest about 6.9 mm/yr since 1998. And, the JODO have been uplifting about 6.1 mm/yr for same period. In 1998, all analyzed observatories which located west from JODO were subsided in the time series of single geodetic coordinates. After the event, height of observatories in Plain area changed back into same level. On the other hand, in the mountain area, JODO and other observatories indicated steeply uplifting after the event.

The characters of the trends of horizontal crustal deformation are different among Toyama Plain, Hida mountain chain and Matsumoto Basin. The difference corresponds to the Seismotectonic Province of Kakimi et al., 2003.