

Characteristics of data observed by multi-component strainmeter installed at Senba, Izu-Oshima

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Meteorological Research Institute installed a multi-component borehole strainmeter at Senba Station in Izu-Oshima, one of the most active volcanos in Japan, in February 2013. By the strainmeter, we aim to research on evaluation of volcanic activity by means of crustal deformation and also to monitor the activity of the volcano. In many cases, unavoidable drift were shown in data of strainmeter installed in a borehole from just after the installation for several years. In order to utilize the strainmeter for volcano monitoring effectively, it is important to grasp the drift and noise quantitatively from early stage of observation. We report a result of research about characteristics of the data observed for about a year.

The strainmeter has 4 sensors which measure linear strains in the horizontal plane in every 45 degrees. In data observed by the sensors, tidal variation of about a day or half day period over 500 nano-strains is obvious, as well as a long term variation. Generally only three components are independent in a plane, the strainmeter has redundancy and it makes us possible to evaluate quality of the data. Examining hourly mean values, all strain components look consistent in the period range of a day or half day. It suggests the data of strain are reliable in the period. On the other hand, the long term variation has an inconsistency as much as 4 micro-strains for 6 month. The inconsistency could be caused by only one sensor of the four, it is difficult to conclude what amount of volcanic deformation is observed at the present stage. In the periods shorter than a half day, almost all variation is less than 2-3 nano-strains. It indicates the accuracy of observation for a short interval.

Keywords: Izu-Oshima, Monitoring of active volcano, Strainmeter, Ground deformation