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Vertical deformation at the northwestern part of Mt. Kirishima(Feb.,2011-May,2011-Mar.,2012)

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Shinmoe-dake, one of the craters of Mt. Kirishima, started eruptive activity in Jan, 2011. In Feb, 2011, when the volcano was still active, remeasurements of 'Ebino highland - Iino elementary school' leveling route, which settled by ERI of University of Tokyo in 1969, were carried out. Deformations between 1969 and 2011 were reported at the last JGU meeting in May, 2011.

In June, 2011, we made remeasurements of that leveling route and extended the route to 'Shin-yu'. We also will make remeasurements of those routes in Mar, 2012.

But, at the time of this abstract, we have no data about remeasurements in Mar, 2012. In the followings, the deformation between February and June 2011 are discussed.

The Vertical movements of benchmarks in 'Ebino highland - Iino elementary school' leveling route show that Mt. Kirishima uplifted from February to June 2011. The maximum uplift is c.a.12mm referred to the bench mark in 'Iino elementary school'. In detail, local depression is detected at the distance of 2-8km from 'Iino elementary school' along the leveling route. But main trend of the vertical movements of the route seems to be able to explain with a spherical pressure source. In this time, we make estimations of the pressure source parameters in consideration of the heights of benchmarks.

The benchmark in 'Iino elementary school' is seemed to be uplifted from the trend pattern of the deformation of the leveling route. We checked the vertical movement of #960714 'Ebino' GEONET station referred to other five GEONET stations located at the northern part of the south-Kyushu district inland, which have no volcanic deformations. As the result, 'Ebino' GEONET station seems to be uplifted 2.9-6.7mm.

Considering that uplift of 'Ebino' GEONET station, we estimated the position of the pressure source by the method of grid searching with the spherical pressure source model in consideration of the heights of benchmarks. As the result, the pressure source locates at c.a. 3km west of 'Karakuni-dake' crater and its depth is 10.2-11.0km, in the case of about 3mm uplift of 'Ebino' GEONET station. In the case of 6-7mm uplift of 'Ebino' GEONET station, the pressure source locates at c.a. 3.8km WSW of 'Karakuni-dake' crater and its depth is 15.2-15.8km.

The estimated horizontal position of the pressure source is similar to the positions estimated by other methods. But the estimated depths by other methods are 4.5-8km and much shallower than the depth estimated bay our leveling survey.

The remaining uncertainty of the horizontal position is elongating in the direction NNE-SSW. As this uncertainty is caused by the locations of bench marks, it will be decrease after the next remeasurements at the leveling route extended in the last survey.

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Keywords: Mt. Kirishima, Shinmoe-dake, volcanic deformation, leveling survey