

Crustal deformation observation after occurrence of 2016 Kumamoto Earthquake by GNSS

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The earthquake (M 6.5) occurred on April 14, 2016. Hokkaido and Kagoshima University settled a continuous GNSS observation site. 2016 Kumamoto earthquake (M 7.1) occurred on April 16 and after the occurrence earthquake activity enlarged to northern region of Aso volcano and central part of Ohita prefecture. Our group started settlement of the continuous GNSS observation site in aftershock area of main shock, around Aso volcano and central Ohita prefecture. Our aims of observation are observation of post-seismic deformation and relationship between seismic activity and crustal deformation.

Twenty-one GNSS sites have been set up by April 28. There are nine sites in aftershock area, four sites in east area to Aso volcano, four sites in the central Ohita prefecture and three sites in southern part of Hinagu fault system. In four sites of 24 telemetering system also installed. In the other sites data are kept on a GNSS receiver or a small computer.

Bernese GNSS Software Ver. 5.2 is used for GNSS data analysis of our newly sites together with GEONET and JMA GNSS sites for volcanoes in Kyushu for the period from April 15 to May 7, 2016. We used CODE precise ephemerides and CODE Earth rotation parameters until April 30 and CODE rapid solution of ephemerides and Earth rotation parameters for the period from May 1 to 7. The coordinates of the GNSS sites are estimated respect to ITRF2008.

North-east displacement at the sites of western side of Hinagu fault and south-west displacement at the site of eastern side of Hinagu fault are observed. However, in the central part of Ohita prefecture and the southern part of Hinagu fault system it seems that no deformation related to earthquake activity.

GEONET RINEX data and RINEX data of Volcanoes' observation site of JMA are used. This study was supported by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan, under its Earthquake and Volcano Hazards Observation and Research Program and Grants-in-Aid for Scientific Research (KAKENHI, Grant Number 16H06298) .

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