Strain distribution around the Hanaori fault in Kinki district of Japan by dense gps network

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We have constructed a dense GPS network around the southwest half of the Hanaori fault in Kinki district, Southwest Japan since 1997. This fault is one of the major active faults in Japan. The surface trace of the fault is about 45km long and the slip direction is right lateral inferred from some geological evidences, but ongoing creep on the fault surface is not recognized on the outcrop. On geological point of view, central Kinki area forms a triangular shape named as 'Kinki Triangle' by Huzita(1962). The Hanaori fault is a part of northwest border of the Triangle. On seismological point of view, the northwest side of this fault is Tamba highlands, where the seismic activity has increased after the Hyogo-ken Nanbu Earthquake(Jan.17,1995, M7.2). And the result of the triangulation surveys over a century revealed the strain contrast around the fault. Surveys in our dense GPS network were started motivated by two interesting points, one is the cause of the contrast in various data, such as geological, seismological and geodetic. The second point is earthquake prediction on this fault.

The analysis of the coordinates of the permanent stations in GEONET, which is national GPS array in Japan operated by GSI, proved high strain rate zone from Awaji Island, located at southwest of Kobe, to Niigata at the Japan Sea coast. The northwest border of 'Kinki Triangle' is located in this zone and also the Hanaori fault is. The mechanism causing this zone is not obvious and the information on strain distribution in this zone is necessary to reveal the mechanism.

Our network consists of 17 newly constructed observation points and the data are analyzed including those at neighboring GEONET stations and some existing stations of Kyoto University. We operate continuously single or dual frequency receiver at four stations of new stations and have made epoch observations twice a year in the other stations. A GEONET station whose seasonal variation in their coordinates is smallest in the surrounding area is decided as a reference point in the analysis. The displacement field referred to the reference point reveals the clockwise rotation. We will finally present the strain distribution in this network. The strain distribution in space is mainly contractive and the dominant direction of the strain is NW-SW direction. But obvious discontinuity in strain cannot be found.