

A Gravity Survey in the Southernmost Area of Uemachi Fault Zone

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1. Introduction

Uemachi Fault Zone is an active fault zone which is about 44 km in length with the north-south strike through the center part in Osaka Plain (Osaka Pref. 1999). The fault zone is composed of some faults. Butsunenjiyama Fault at Toyonaka City is consist in the most northern part, and Kumedaiké Fault in the most southern part at Kishiwada City. Properties of the Kumedaiké fault investigated in detail by Osaka Pref. (1997), Osaka Pref. (1998), and Osaka Pref. (1999). The reflection survey and the boring exploration were mainly investigated in these studies. In those papers, a vertical displacement and its average velocity were discussed. However, neither shape nor properties of the edge of the fault zone are clarified in general. It is a very interesting problem to discuss the formed process and the behavior of the fault. Therefore, to obtain the finding of this shape, gravity measurement was executed around Kumedaiké Fault which lay the southernmost part of Uemachi Fault Zone in this time.

2. Investigation area

Some survey lines were set along the roads from the vicinity of Obucho where is the center part of Kishiwada City, Osaka Pref. to the vicinity of Inabacho. These roads almost perpendicular to Kumedaiké fault. Each survey line almost made a position of the active fault shown by Geographical Survey Institute (1996) a center. The length of each survey line is about 1-5 km. Moreover, the station interval is about 50 m.

3. Measuring method

Gravity was measured with gravimeter G-308 made by the LaCoste & Romberg company. The provisional reference point of the gravity was set in Kinki Polytechnic College in Inabacho, Kishiwada. Closed-loop was drawn with measuring the gravity in this point before and after the investigation during a day. The gravity value in this provisional reference point was decided by relative measurement with the gravity value on the first order gravity station at Wakayama Local Meteorological Observatories.

4. Measurement result and consideration

The measurement result shows distribution that the north side as seaward is lower and the seaward is higher along a survey line which crosses the position assumed to be a lying behind part of the Kumedaiké Fault (Geographical Survey Institute, 1998). Geographical features, where displacement is shown, do not appear directly in surface of the earth because here has cracked to an alluvial deposit. If these measurement result and the theoretical gravity sections of two dimension fault structure are compared, rising ratio of the gravity value in the north side of the presumed fault position is a little larger than another side. The above-mentioned tendency suggests that this fault be a reversed fault.

5. Conclusion

In detail decently, the distributions of the gravity values were clarified along some survey lines

which cross Kumedaïke Fault at this time. These distributions suggest the fault structure. In the future, it is necessary to execute that the three-dimensional structure is analyzed based on these distributions.

Keywords: gravity anomaly, reverse fault, basement structure, Kumedaïke Fault, 3D structure analysis, high dense gravity measurement