# The growth process of active fold around the source region of 2004 Mid-Niigata Prefecture earthquake

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The earthquake of magnitude (Mj) 6.8 occurred in the central part of Niigata Prefecture on October 23, 2004. Focal depth was 10km. This earthquake was named the '2004 Mid-Niigata Prefecture earthquake'. The focal mechanism of the main shock was a reversed fault type with the compression axis of the direction of NW-SE. This strike of fault and extension of the aftershock region have the almost same direction.

In previous reference, the active faults were indicated in this area. They are Obiro fault, Muikamachi fault located in the south. However, clear surface displacement is not recognized on these faults. The gaps of a small scale have appeared intermittently on the extension of these faults, or parallel lines. But the relation of these gaps and earthquake source fault is unknown in this time.

Source region of this earthquake is located in the active fold area. As the geological situation, the Neogene sediment is distributed thickly. The displacements of earthquake source fault which generated this earthquake are accumulated, the thick sediments bend, and folds grow gradually.

A seismic reflection profile line 87-1 in the 'Kubiki-Tamugiyama area' 1987 basic geophysical exploration which METI (Ministry of Economy, Trade and Indusry) carried out crossed the southern part of the Uonuma hill located in the source region. In this study, we carried out re-processing of this data. And based on this result, we considered the growth process of basins and hills distributed around the source region. We grasped the undersurface depth of each units based on this profile. And restored section was created and the amount of vertical movements by present was estimated to each units. The target units are Uonuma formation, Haizume formation, Nishiyama formation, and Siiya formation in that case. As the results of analysis, active field has been recognized in the area which contains Yamanaka anticline and Tsuboyama anticline in the age from Siiya formation to Haizume formation. Then, active field has been recognized in the area which contains Tsuboyama anticline and Uonuma hill in the time of Uonuma formation. That is, it seems that active field moved east. However, seismic reflection profile used by this study has not reached to the Muikamachi basin located in the east of a Uonuma hill. Therefore, in order to understand the relation of these results and earthquake source fault of 2004 Mid-Niigata Prefecture earthquake, seismic reflection survey needs to be carried out further.

In addition, CRIEPI will carry out seismic reflection survey which crosses source region of 2004 Mid-Niigata Prefecture earthquake in March, 2005 in cooperation with ERI. Based on this result, we consider the relation of earthquake source fault, crustal structure, and active structure recognized on surface.

In this study, we used a seismic reflection profile line 87-1 in the 'Kubiki-Tamugiyama area' 1987 basic geophysical exploration which METI (Ministry of Economy, Trade and Indusry) carried out.