

# The 2004 Mid-Niigata Prefecture Earthquake: the growth of folding structure and earthquake

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It is proved that the active tectonics on the Mid-Niigata earthquake area has four weakness zones within two kinds of reverse fault systems and displacements for vertical component (v.c.) and the horizontal component (h.c.) from our investigation on the ground deformation. Those are, from west to east, 1. step over zone between Higashiyama anticline (v.c. 71.5 cm by G.S.I) and Tamugiyama anticlines (v.c. ca. 40 cm by G.S.I, h.c. 16 cm), 2. Suwatoge flexure and north expression, 3. Tagawa weakness zone, and 4. Muikamachi fault. These geological structures respectively have the strike NNE-SSW to NS trending and the sub-parallel relationship. The nt, those are omitted in following v.c. and h.c., are compared in the each weakness zone. The displacements are as bellow: for northern half of the Muikamachi fault (v.c. 20 cm, h.c.8cm), for Tagawa weakness zone (h.c. 2 cm) and for Suwatoge flexure (v.c.40 cm, h.c. 16 cm). The vertical componet for Tagawa weakness zone, here, is not detected from leveling survey. The vertical displacements measured at the step over zone between Higashiyama and Tamugiyama anticlines are ca.70 cm and ca.40 cm respectively. The vertical displacement leveled on the syncline between anticlines has a value as simile as one done on the Tamaugiyama anticline. The value of v.c.70 cm measured on Higashiyama anticline intend to be the summed up value to one done on Tamugiyama anticline.

The eastern flank of Tamaugiyama anticline has a steep structure, and the part of which is called as the Suwatoge flexure (Yanagisawa et al., 1986; Kim, 2004). The shortening deformation, here, is associated with the compression in the east-west direction. This indicates that the anticline grew reult the blind thrusting, which dip down to the west. Actually, the displacement location of the surface fault is consistent with an upward extension of the main shock fault inferred from the aftershock locations. The largest aftershock hypocenterThe temoral aftershock observation