The nature and importance of minor faults developed in the Niigata-Kobe Tectonic Zone

*Kiyokazu Oohashi¹, Makoto Otsubo², Ayumu Miyakawa³, Masakazu Niwa⁴

1.Graduate School of Science and Engineering, Yamaguchi University, 2.IEVG, National Institute of Advanced Industrial Science and Technology (AIST), 3.IGG, National Institute of Advanced Industrial Science and Technology (AIST), 4.Japan Atomic Energy Agency (JAEA)

Recent GPS geodetic observations revealed inhomogeneous strain-rate pattern of the Japan Island (Sagiya et al., 2000, PAGEOPH), even in the back-arc region where the heterogeneously-coupled plate boundary condition may not be affected. The Niigata-Kobe Tectonic Zone (NKTZ), which trends northeast-southwest direction in central Japan, shows dextral movement of ~ 10 mm/y as detected by the dense GPS observations (Ohzono et al., 2011, Geophys. J. Int.). The NKTZ bearing three major active faults; the Ushikubi fault, the Atotsugawa fault, and the Takayama-Oppara fault. If we assume the elastic strain accumulated within the NKTZ is released by the slip along the active faults, short-term strain rate obtained by GPS observation should be equal to the total amount of long-term slip rates of the active faults. However, only about 50 % of the accumulated shear strain is released along the active faults. Here we demonstrate a field occurrence, distribution, mineralogy, and paleostress analysis of minor faults (off-fault damage) distributed in the NKTZ and propose these faults play an important role in the crustal deformation.

Keywords: Niigata-Kobe Tectonic Zone, Atotsugawa fault, C-class active fault, Paleostress analysis, Strain-rate paradox