

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

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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