

# Crustal deformation inferred from GPS Observation of the Atotsugawa Fault System in the northern Chubu District, central Japan

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The Atotsugawa fault system (AFS), composed of several right-lateral strike-slip such as the Atotsugawa fault and Ushikubi fault, is the most active structure in the northern Hida region of central Japan. Based on GPS geodetic data, Ooi et al. (2003) suggested a viscoelastic weak zone in the lower crust deeper than 15 km beneath the Niigata-Kobe tectonic zone (NKTZ). Meanwhile Matsuura et al. (2003) analysed the block behavior of the fault system as follows. (a) The area occupied by AFS is divided into four fault blocks. (b) The Hosoiri block and the Takayama block are moving like rigid bodies.

Additionally, a fractal relationship such as a nested structure composed of a wider zone of strain concentration, narrower shear zones, and individual fault blocks is recognizable.

In this study, in order to elucidate the relationship of AFS with the zone of crustal strain concentration and shear zones in detail, we analyzed the GPS data of the northern Chubu district, with utilizing software GAMIT.

The analytical results of the study are as follows. (1) Different strain fields are bounded by the area of AFS and its extension. (2) While the northern domain moves northeast, the southern domain does west-northwest. It is suggested that the eastern portion of AFS is extending and the western is contracted. (3) The isolated movement around the Matsumoto basin, beyond the Japan Alps, is conspicuous, and it is necessary to consider the cause of peculiar movement there.