

## TECTONIC CREEP OF THE ATOTSUGAWA FAULT SYSTEM, INFERRED FROM GPS OBSERVATION

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The Atotsugawa fault system, composed of several right-lateral strike-slip faults, such as the Atotsugawa fault and Ushikubi fault, is the most active structure in the northern Hida region of central Japan. It occupies the Hietsu area about 20 km in width with a length of about 80 km in an ENE-WSW trend.

Multidisciplinary studies from various viewpoints have been conducted on the system, especially on the master fault of the system, Atotsugawa fault. Recently ten years geodetic monitoring based on laser ranging suggested a near surface creep movement of the central part of the Atotsugawa fault. However, there exist some questions still unsolved, for example, how deep the creep reaches on the plane of the Atotsugawa fault, how large the rate of creep movement is, and whether any creep movement occur on the other faults of the system.

In this study, in order to reveal the feature of creep movement of the fault system, we analyzed the GPS data during the period from April 24, 1997 to August 31, 2002, around the Atotsugawa fault system, with utilizing the GPS analyzing software GAMIT for the analysis of the above GPS data. These data were from both Geographical Survey Institute of Japan and the Atotsugawa GPS array observation by Nagoya University.

The results of the analysis suggest interesting behavior of the fault system as follows. (1) A right-lateral displacement is remarkable within the Atotsugawa fault system. With fixing a point nearby Atotsugawa fault, displacement pattern of GPS stations shows a tendency that becomes larger with the distance of the fault. (2) All three stations in the eastern half of the Hietsu fault-block between the Atotsugawa and the Ushikubi faults evidenced a clockwise rotation, suggesting that the fault-block behaves as a rigid block. (3) The Hietsu fault-block is further divided into two sub-blocks (Hosoiri and Mozumi sub-blocks) by the Mozumi-Sukenobe fault. (4) Perpendicular components of horizontal displacement indicate a transpressional condition within the fault-block, while parallel components demonstrated the obvious right-lateral movement.

This study clarified the displacement feature of the eastern half of the fault system and evidenced creep faulting with block rotation through the entire width of Hietsu fault-block. Analysis of vertical components of GPS displacement field is necessary to clarify detailed behavior of the whole fault system.