

A Dense GPS Observation Around the Northern Itoigawa-Shizuoka Tectonic Line

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The Itoigawa-Shizuoka Tectonic Line Fault System (ISTL) is one of the most active faults in Japan. Since there has been no large earthquake in history, the fault has a high probability of a large event in the future. As a part of the intensified observation in order to improve estimation of future earthquake probability and estimation of strong ground motion, we have conducted a dense campaign GPS observation around ISTL since 2002. We analyzed the observation data at 28 campaign sites with those from surrounding continuous sites. We estimated crustal deformation velocity based on the results after 2003, which are free from artificial noise due to the GPS antenna replacement. The estimated velocity data are similar to those estimated from daily coordinate data of continuous sites, implying that campaign observation is capable of realizing mm-level accuracy under a steady deformation condition. The campaign observation results revealed following characteristics about the crustal deformation around ISTL. (1) Concentrated shortening around the West Nagano Basin Fault. (2) The Central Uplift Zone is characterized by very small deformation and the deformation front is located its western edge. (3) Deformation type changes from a WNW-ESE shortening to a left-lateral strike slip around Akashina. (4) As a result, the Gofukuji Fault and the Central ISTL are characterized by strike slip faulting. (5) Block-wise rotation occurs at the southeast of the Atotsugawa Fault, implying the Atotsugawa Fault System plays a role as a mechanical boundary. In spite of its poor temporal resolution, campaign GPS observation is quite effective in establishing a dense network at low cost as a supplement to the continuous network. It is the most suitable for the region like around ISTL where crustal deformation is large.