

# Distribution, geometry and slip rates of branch faults around the Kita-Izu fault zone

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In the northeastern part of the Izu Peninsula, there is the Kita-Izu fault zone which extends N-S direction. A branch fault group showing NW-SE strike (Earthquake Research Committee, 2005) is distributed in the east side of the Kita-Izu fault zone. However, slip rates of branch faults have not been estimated. Additionally, the distribution and formation ages of geomorphic surfaces around the Kita-Izu fault zone have not been revealed. Thus, we focus on branch faults (oblique, subparallel to the Tanna fault or Ukihashi central fault) and clarify the distribution, geometry and slip rates of them. Furthermore, we reveal the distribution of geomorphic surfaces around the Kita-Izu fault zone and consider formation ages of them.

In this study, we carried out geomorphic interpretation, field surveys, and measuring the amount of displacements of branch faults using DEM data. In field surveys, we observed fault topographies along active faults and deposits forming geomorphic surfaces around active faults.

From geomorphic interpretation, branch faults are located mainly on the east side of the Tanna fault and the Ukihashi central fault. They are composed of left-lateral slip faults striking N-S and right-lateral slip faults striking NW-SE or E-W. From field surveys, deposits that can estimate formation ages of geomorphic surfaces were not identified. Therefore, we used ages of geology (Oikawa et al., 2011) as lower limits of formation ages of geomorphic surfaces.

Lower limits of slip rates of branch faults were estimated using vertical and horizontal displacements and lower limits of formation ages of geomorphic surfaces. As a result, lower limits of horizontal and vertical slip rates of branch faults were estimated to be 0.10-1.0 mm/yr and 0.01-0.10 mm/yr, respectively. Similarly, we estimated horizontal slip rates of the Tanna and Ukihashi central faults and compared to those of branch faults. Then, we found that horizontal slip rates of Tanna and Ukihashi central faults are one order larger than those of branch faults. Thus, the activity of branch faults is considered to be lower than that of Tanna and Ukihashi central faults. In the north of the Tanna fault, left-lateral slip active faults striking N-S or NW-SE are located. These faults and the Tanna fault form right-stepping en echelon arrays and their slip rates are larger than those of branch faults. Furthermore, there is a possibility that they acted with the Tanna fault in Kita-Izu earthquake in 1930. Thus, some left-lateral slip active faults located in the north of the Tanna fault may constitute the northern end of the Tanna fault.

Keywords: Kita-Izu fault zone, Tanna fault, Ukihashi central fault, branch faults, slip rate