Structural analysis and the direction of compressive stress along the Kannawa fault as a leading edge of collision of Izu arc

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Information of the compressive paleostress direction in the collision zone is important clue to elucidate the tectonic event of collision of the Izu arc. The paleostress analysis using fault slip data was applied on the Kannawa fault which extends the southern part of the Tanzawa mountains from east to west. This fault is regarded as one of the faults constituting the boundary between the Philippine Sea plate (Izu arc) and the continental plate (Honshu arc).
Stress tensor inversion technique which can detect multiple paleostress conditions has been developed. In this study, the Hough transform method (Yamaji et al., 2006) which is one of stress tensor inversion techniques was applied. The fault-slip data set is composed of fault orientation, slip orientation (lineation) and sense of slip. Furthermore, the different types of the incomplete data, i.e., unknown slip sense and unknown slip orientation, and also perfect data can be mixed in the Hough transform method (Sato, 2006). Since the number of the data collected was insufficient, we analyzed adding the data of the previous study (Kano et al., 1988; Hoshino and Hase, 1977) along the Kannawa fault. The segments of the Kannawa fault are divided into two; western (Shiozawa fault system) and eastern (the Kannawa fault system in a narrow sense) divided by the Kochi River running from north to south (Active fault data base of Japan after AIST). Therefore, we divide the analytical data from both segments. The predominant stress in the NW-SE direction (σ_1) and in the vertical direction (σ_3) in the western segment, and in the ENE-WSW direction (σ_1) and in the NNW-SSE direction (σ_3) in the eastern segment were detected.
The σ_1 orientation (NW-SE) from the western segments is concordant with the result of paleostress analysis on the small fault system in Ashigara group by Huchon and Kitazato (1984) and Amano et al (1986). This NW-SE compressive stress can be considered as a result of the northwestward subduction of the Philippine Sea plate after 1.0 Ma. The compressive stress of ENE-WSW from eastern segment can be related to the paleostress forming a large anticline with axis of NNW-SSE in the Ashigara Group.
However, only a small number of the slip data sets can be used in the eastern segment, therefore, the final paleostress result should be reported after getting sufficient data from the eastern segment.

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