

Vertical-axis block rotation by reactivation of pre-existing faults in the Koshikijima Islands, the northern Ryukyu Arc

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We presented a new paleomagnetic data from the Koshikijima Islands to examine the relationship between vertical-axis block rotations and fault displacements in a backarc region. More than 300 samples from 29 sites were collected from two kinds of dike swarms (the Type 1 dikes and the Type 2 dikes) in the Koshikijima Islands. The paleomagnetic direction of the Type 1 dikes, which intruded in the Middle Miocene, shows a westward deflection respect to that of eastern Asian continent. On the other hand, the paleomagnetic direction of the Type 2 dikes, which intruded in the Late Miocene, shows no significant discrepancy respect to that of eastern Asian continent. These paleomagnetic directions indicate that the Koshikijima Islands experienced about 40 degrees counter-clockwise rotation during the Middle to Late Miocene. Based on comparison between the paleomagnetic directions and the geologic structures in the Koshikijima Islands, we divided the extensional deformation history in these islands into three stages; (1) ENE-extensional deformation without vertical-axis block rotation, (2) WNW-extensional deformation with vertical-axis block rotation, and (3) WNW-extensional deformation without vertical-axis block rotation.