

## Did clockwise rotation of coherent SW Japan case paleomagnetic declinations observed there?

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Paleomagnetic declinations (PDs) observed in rock samples could be caused by various scale and mode of horizontal rotations, such as a coherent rotation of a large tectonic domain, rotations of blocks bounded by faults and shear deformation by strike-slip tectonics. Examinations taking account of geological structures, such as orientations of faults and fold axes, are required to determine the scale and mode of horizontal rotations causing PDs.

Eastward PDs observed in SW Japan are regarded as definite evidence for the double door (DD) model of the opening tectonics of the Japan Sea (Otofuji, 1996). In such a model, geological evidence for the coherent rotation of SW Japan is not adequate. The DD model regards the Paleozoic strata in SW Japan as the extension of the Okchon Belt in the Korean Peninsula. This geological link, however, was criticized as inadequate (Matsumoto, 1967; Ichikawa, 1972). Moreover, the DD model is not consistent with geological relationships between north Kyushu and its tectonic vicinities. NNE-SSW faults are developed in the Cretaceous strata at north Kyushu and SE Korea. NNW-SSE to NW-SE faults are developed in the north Kyushu sedimentary basin and the East China Sea Shelf basin. Foldings and faults oriented to ENE-WSW are developed from northeast Kyushu to the western Chiguoku district, SW Japan. These geological features indicate that SW Japan would not have carried out meaningful horizontal rotation with the respect to the Korean Peninsula and the East China Sea.

Instead, these geological features indicate that eastward PDs observed in SW Japan would have been caused by rotations of faulted blocks. The amount of PDs decreases from the Chugoku district to northwest Kyushu (Ishikawa, 1997). The Philippine Sea Plate gently subducts to the Eurasian Plate at the Chugoku district, whereas it steeply does at Kyushu. These features indicate that the mechanical coupling between the overriding Eurasian Plate and the subducting Philippine Sea Plate would have been caused the horizontal block rotations.

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