

Deformation structure of the Shimanto accretionary complex and its AMS fabric

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In this study, I examined whether the anisotropy of magnetic susceptibility (AMS) can be used as an indicator of evaluating the strain and/or deformation processes of the Shimanto accretionary complex in Kochi prefecture. I measured AMS of the samples cored from outcrops of the Shimanto accretionary complex, and compared the AMS-fabrics with deformation structures of the complex at several localities. Along with the field observations, a series of deformation experiments were performed on artificially prepared granular samples, and the AMS fabrics of the deformed samples were measured.

To prepare the artificial samples, I crushed the mudstone of Yokonami melange, sieved to 106-250 micrometer and cemented the sieved grains with a resin. After AMS measurement of the initial samples, I pressed the samples with 50t press and measured AMS again. This result shows change of the degree of AMS with an increasing trend almost proportional to the experimental value of the strain.

Mudstone samples from coherent unit show high values of the degree of anisotropy of AMS and the shape of the AMS ellipsoid is oblate. Sandstone samples show low values of the degree of anisotropy of AMS. I applied the relation of the degree of anisotropy of the AMS fabric and the strain obtained in experiment to these results. From the result of calculation, mudstone layer is more compressed than sandstone layer.

In the Yokonami melange, I picked the samples from the right lateral sheared rock. In thin-section observation, typical asymmetrical fabric in brittle shear zone is recognized. From the results of AMS measurement, AMS ellipsoid rotated clockwise. This agrees with the sense of shear from the outcrop observation.

In the Nonokawa formation where pseudotachylyte is reported, the degree of AMS slightly rises near the fault. It is possible that the drag of fault movement caused the rise of the degree of AMS.

In thin-section observation in Kure melange mudstone, clasts having asymmetrical tails are recognized. But the degree of AMS is much lower than mudstones in others area