Geophysical Research Abstracts
Vol. 14, EGU2012-5608, 2012
EGU General Assembly 2012

The deformation path partitioning within the multiply deformation area, Tananao complex, Taiwan

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In the junction of the Eurasia plate and the Philippine Sea plate system, the rocks was under multiply deformation that relates to metamorphism and its associated deformation; the formations of Taiwan Island was due to the collision/accretion of the Luzon arc with the eastern margin of South China Sea. Resolving the sequence of these structures is problematical because the later fabrics usually destroyed the earlier ones. It was quite difficult to rebuild the deformation history in these multiply deformed terrains, even after detailed mapping work. There were still many problems in interpreting the history of deformation in Tananao complex.
A fundamental trait of analyzing in multi-deformed rock is deformation path partitioning, which results in the regional preservation of complex geometries. This study provides detailed description of multiply deformation area in Tananao complex, with a range of lineation orientations and compare with refolding structures. Tananao complex was characterized by complicated foliations, transposition structures, folds and refolding geometries. We analyzed these refolding structures by interference patterns to identify which generation each fold hinge belongs to, pointing out continuity of a single hinge from one level to the next, and correlating with the regional foliations and intersection lineations in microtectonics. It was partitioned that the deformation history of Tananao complex was the cumulated fabrics from earlier E-W trending deformation, then NE-SW trending deformation later. We can observe it with mesoscopic type-1, type-3 fold interference patterns and microscopic crenulation cleavages. The rocks in Tananao complex was the oldest rock of Taiwan during the Pre-Taiwan-Philippine system, studying the geologic structures in Tananao complex will be quite helpful to understand the tectonic evolution events and geological history of Taiwan.