

Deformation history of the Chimei Fault, eastern Taiwan: Insights from paleostress and fold analysis

KUO, Szu-ting^{1*}

¹Institute of Geosciences, National Taiwan University

The Chimei Fault, the only fault cutting across the Coastal Range in eastern Taiwan, is the boundary fault that thrusts the forearc basement (Tuluanshan Formation) over the forearc sedimentary rocks (Paliwan Formation). Although previously deemed to be a reverse fault with strike-slip component, paleostress pattern along the Chimei Fault zone has not yet been established. In order to reconstruct the deformation history of the fault, this study carries out paleostress and fold analysis along a well-exposed outcrop in the central part of the Coastal Range.

The Chimei Fault zone is composed of 100 and 500-m wide damage zones in the hanging wall and the footwall, with several sets of subsidiary faults developed intensely. Based on crosscutting relationship, the fault-slip data could be divided into three stages. The earliest stage is characterized by the left-lateral fault slickensides that crosscut mineral veins related to heat flow activity in the Tuluanshan Fm. In the footwall, a 100 m-wide fold zone, including boudins and mud-filled veins, indicates deformation of buried unconsolidated sedimentary rocks during the second stage. The third stage is characterized by brittle subsidiary faults. The predated folds and postdated brittle faults indicate that the deformation depth of fault rocks decreased during faulting. In addition, both folds and faults show N-S compression, suggesting that two structural processes record the same paleostress status.

The three-stage evolution could be comparable to previous reconstruction from paleomagnetic analysis: (1) The initial left-lateral component is consistent with island-arc movement since late Miocene; (2) Folding and faulting of the footwall then illustrate the N-S forearc closure since late Pliocene.

Keywords: fault damage zone, paleostress analysis, fold analysis, reverse fault