



Structural analysis from reflection seismic data in the lower slope domain of the accretionary wedge offshore southwestern Taiwan

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The accretionary wedge offshore southwestern (SW) Taiwan was formed by the subduction and arc-continent collision processes successively. Different structural styles were observed in the frontal and rear segments of the accretionary wedge: blind thrusts and monoclines are recognized in the frontal segment, while outcropping thrusts and symmetrical anticlines are dominant in the rear segment. However, the deformation mechanisms for the frontal and rear segments of the accretionary wedge are still poorly understood.

In order to understand the development of the tectonic deformation in the accretionary wedge, we reprocessed couple large-offset reflection profile data and generated depth sections. Then we analyzed the dip angles between the strata and the fault-related-fold system in a quantitative method proposed by Suppe [1983] based on the seismic images in depth sections. Afterwards, the structures can be recognized in different types, such as fault-propagation folds, fault-bend folds and detachment folds, at different regions in our study area. Finally, we integrate all the geologic interpretations from structural analyses into a geologic model to illustrate the deformation mechanisms and the evolution of fold and fault structures in the frontal and rear segments of the accretionary wedge. This study demonstrates that the geometry of the structures and the deformation mechanisms may help reveal the tectonic evolution history.