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Mud Diapir Structures in Southwest of Taiwan

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Taiwan Orogenic belt was result from arc-continental collision between Philippine Sea Plate and Eurasia Plate. The Philippine Sea Plate moves to NW direction with about 8 cm/yr that creates an active fold and thrust belt in western Taiwan.
In central Taiwan the displacement rate of the GPS is near 1-2 cm/yr and it increases to 5 cm/yr in southwest of Taiwan.
The major strata are comprised of late Miocene to Plesitocene Gutingkeng Formation, Erchungchi Formation, and Lioushuang Formation in southwest of Taiwan. The Gutingkeng Formation can be separated into lower and upper Gutingkeng Formation and the total thickness is more than 4000m. The lower Gutingkeng Formation is comprised of deep sea mudstone. From the upper Gutingkeng Formation to Lioushuang Formation is characterized by coarsening upward sequences which are related with foreland basin deposit.
Different models have been purposed to interpret the structural style such as fault-related folding, duplex structures, mud diapiric folding. In this study we combined leveling, deep seismic profiles, GPS data, and structural analysis to identify that most of structures are related with mud diapiric folding with high amplitude and thrusting in southwest of Taiwan. The lower Gutingteng Formation is the diapiric folding strata and Erchungchi and Lioushuang Formation are growth strata. Two major deformation mechanisms are involved; the first is that the high fluid pressure in sandy layer of the lower Gutingkeng Formation induces vertical motion and the second is that the horizontal compression stress results in flexure slip folding and thrusting.