Geophysical Research Abstracts
Vol. 14, EGU2012-9700, 2012
EGU General Assembly 2012

Development of an Intra-Slope Basin Offshore Southwestern Taiwan

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Distribution and architecture of intra-slope basins across continental slope vary as a consequence of accommodation forming, sediment dispersal rates, canyon cutting, sediment filling and different sediment transporting mechanisms. The area offshore Southwestern Taiwan is generally recognized as having active tectonics and high sediment deposition rate. In the Gaoping Slope, intra-slope basins are formed by the development of faults, diapiric intrusions and folds. Parts of sediments discharged from the Taiwan mountain belt have been trapped in these basins in the Gaoping Shelf and Gaoping Slope. The rest of those sediments have been transported to deep sea area through submarine canyons which also passed some of basins in the slope area. This complex system of faults, diapirs, folds, basins, canyons, and sediment deposits also readjust morphology of the Gaoping Slope region. This study examines the development of an intra-slope basin in the upper-slope domain of the Gaoping Slope through seismic facies analysis. 2D seismic reflection profiles as well as a 3D seismic volume are used to reveal the complex development of this slope basin. 6 stratigraphic units have been identified in the basin, and 8 diapiric ridges and diapirs are observed either bounded this basin or developed within the basin. The growth relationships between different stratigraphic units and diapirs provide us relative time constraints on the sedimentation and structural developments of this basin. Mass transport deposits (MTDs) are frequently observed within the basin strata, suggesting unstable deposition environment. The source of the orogenic sediments deposited in the basin mostly came from north, but the most recent sediments are brought in from the Fangliao Canyon which lies to the east of the basin. From the detail 3D seismic images, we propose a development model of this slope basin.