Tectonic Features and Megathrust System Offshore South Taiwan

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Located in the Taiwan-Luzon convergent belt, offshore southern Taiwan is one of the ideal natural laboratories to study magatrust faults. Morphotectonic features offshore southern Taiwan suggests that the width of the collisional wedge decreases southward and connects to the northernmost part of the Manila subduction system. Reflection seismic profiles across the southernmost Taiwan collisional belt reveal not only fold-thrust belt in the frontal (western) part of the collisional wedge, but a magatrust system with splay faults, which is also supported by OBS velocity profiles. In order to better understand this megathrust system and its variations from south to north, as the tectonic processes changes from subduction in the area offshore south Taiwan to collision on land Taiwan, we analyze a series of large-offset deep seismic reflection profiles that ran across this megathrust fault system. Decollement has clearly been observed below the lower slope domain of the accretionary wedge. The range of the decollement increases from south to north, inferring that the continental materials have been carried into the subduction zone and the subduction angle decreases from south to north. The crustal velocity model derived from OBS data suggests the possible existence of tectonic underplating beneath this collisional belt. The existence of the megathrust system represents this area have high potential of seismic and tsunami threat.

Keywords: offshore southern Taiwan, collisional belt, OBS

