Geophysical Research Abstracts
Vol. 17, EGU2015-9725, 2015
EGU General Assembly 2015

The buoyancy variation of plate coupling from subduction to collision: an example across the northernmost Manila trench

Chung-Liang Lo, Wen-Bin Doo, Hao Kuo-Chen, and Shu-Kun Hsu
Department of Earth Sciences, NCU, Jhongli, Taiwan (lo.chungliang@gmail.com)

The Manila trench is the boundary between the South China Sea (SCS) of Eurasian Plate (EU) and Philippine Sea Plate (PSP). The east subducting of SCS is a ceased rifting oceanic crust. To the north, the subduction is obscured and transits to collision extended to the Taiwan orogenesis. The Taiwan Integrated Geodynamics Research (TAIGER) project has implemented several offshore multichannel seismic (MCS) reflection and wide-angle seismic experiments to model the velocity structure of the incipient arc-continental collision. Amongst, along two trench perpendicular transects (MGL0905_23, 25) are associated with ocean bottom seismometer (OBS) deployed in the northern Manila trench. The transect MCS data and tomographic velocity structure provide well constraint on the recognition between the crust and mantle lithosphere that helps to reconstruct synthetic density structure to fit the observation gravity data. The synthetic gravity result along two transects also show that there exists an anomalous high density ($\sim$2.97 g/cm3) mass beneath the accretionary prism in the leading edge of overriding plate; however, unfortunately, the MCS and OBS data have no resolution there. Meanwhile, the buoyancies of crust (Hc) and mantle lithosphere (Hm) can be calculated associated with the residual topography based on the isostatic equilibrium. According to the contribution of Hm, the estimation of the plate coupling effect can be approached. Combining two transects data across the northern Manila trench and one profile across the Hengchun Peninsula in southern Taiwan (T29-33, TAICRUST project), a sequence from subduction to collision of plate coupling effect can therefore be evaluated, and also offers the opportunity to examine the lithospheric structure variation in the zone between Taiwan and northernmost Manila trench.