



## Onshore and offshore seismic experiment in the northern South China Sea

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The Cenozoic tectonic evolution of the South China Sea is involved in many broad tectonic processes. The lithospheric extension process will be benefit from seismic investigation in this passive continental margin. The previous seismic investigation mainly focused on the continental slope and ocean basin or the continent-ocean transition zone in the northern South China Sea. However, in the continental shelf segment, there is a big gap when to built a thinned passive margin model in the northern South China Sea. To understanding the extension process, in 2010, a wide-angle seismic profile with the lengths of 205 km was shot across the continental shelf with the water depth of 20-100 m. A 4 channel seismic reflection data was collected along this refraction surveying profile. Totally 14 seismometers were deployed including 5 temporal land stations deployed onshore South China and 9 ocean bottom seismometers (OBSs) offshore beneath the continental shelf of the northern South China Sea. The clear refraction phases (Pg) through the crust and reflection phases (PmP) from the Moho interface are recorded in these stations. A velocity-depth model beneath the continental shelf is constructed and modeled by using joint refraction and reflection tomography method. 100 Monte Carlo ensembles are constructed by uncertainty analysis. The along-strike variations of the velocity structure are strong from onshore to offshore. The depth of Moho is about 25-28 km and thinner the previous hypothesis of numerical modeling with depths of 30 km. The thickness of the crust in the continental shelf represents a giant thinned continual crust caused by lithospheric extension in the northern South China Sea.