The crust and upper mantle structure of East China and adjacent sea

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The East China, Yellow Sea and Korean Peninsula located on the east of Eurasian Plate and west of Pacific Plate(Philippine Plate), the interesting research area includes North China Block, Korean Peninsula Block, Lower Yangtze Block, Dabie Orogenic Zone, Sulu Block and Yellow Sea. The 3-D seismic tomography image (114°-130° E,29°-38° N) have been inversed by using the Multiphase Traveltime method after relocated earthquakes by DD and GA. The crust can be divided into upper, middle and lower. The buried depth, interface velocity for upper, middle and lower crust are: 12-15km, 6.16-6.27km/s, .22-26km, 6.74-6.80 km/s, 29.1-39.8km, 7.88-8.21km/s, respectively. The average depth of Moho in Korean peninsula is 29.8km with interface velocity of 8.01km/s. The Moho in Yellow Sea is about 30km. The features of deep structure for various sub-tectonic provinces are: for Dabie Orogenic Zone: deepest Moho, shallower focus, highest interface and RMS velocity; for North China Block, most shallow Moho, more deeper focus, more higher interface and RMS velocity, for Lower Yangtze Block, deeper Moho, more deeper focus, lower layer velocity and RMS velocity. The Moho contour is agree basically with tectonic provinces. The velocity differences among different tectonic province for Korean Peninsula are obvious, especially, Kyonggi Massif, Okchon Fold Zone, Taebaesan Fold Zone, Imjingang Fold Zone. The Tancheng-Lujiang fault belt with 2400km long is biggest deep fault in eastern of China,. It appears different movement mode for various segments. In the southern segment (south of 33 ° N) the velocity in belt is higher than out. The velocity difference both of fault belt is obvious, it is appears thrust or normal fault. The compressional action from Dabie Orogenic Zone to Lower Yangtze Block may be the causation for the feature. In 33° -38° N, the velocity in belt is lower than out., it is appears strike slip with thrust, may be the tectonic action is not stronger between North China Block and Lower Yangtze Block.

Zhu Jieshou & et al consider that the lithosphere thickness for Lower Yangtze Block is 90km, for eastern North China Block is 72km, the Lower Yangtze Block may subduct into North China Block under Sulu Orogenic Zone, the high-velocity slab is also remnants ancient subducted Yangtze Block. They consider that the thickness of lithosphere in west Pacific marginal Seas, North China, South China, continental shelf of East Sea are 50-80km with 4.25-4.4km/s of bottom S velocity, but in Pacific Plate and Philippine Plate the lithosphere velocity is higher than above, appears the Pacific Plate subduct into Eurasian Plate. The thickness of lithosphere in the middle and west of east Asian continent are about 80-100km with 4.5-4.6km/s of bottom S velocity, the thickness of asthenosphere are about 40-100km. There is a big lower velocity zone in upper mantle, like as velocity structure of Pacific mid-oceanic ridge. May be it is the evolution result from Mesozoic to Cenozoic period for East Asian continent.