

Imaging of Crustal Structure across the Red River shear zone (Northern Vietnam) from Seismic Linear Array Observations

*DUONG VAN NGUYEN, Bor-Shouh Huang

The Red River fault is the first order tectonic structure running from the southeastern margin of the Tibet plateau to the South China Sea that separates the South China block to the north and the Indochina block to the south. Hence, understanding the Red River fault structure is critical for evaluating the hypotheses of the tectonic evolution of Southeast Asia and the extrusion mechanism along the Red River fault caused by the continent-to-continent collision between the Indian and Eurasian plates.

Using a 250 km long profile of 25 broadband seismic stations across the Red River fault in northern Vietnam has provided a high-resolution P receiver function section which interpreted in term of crustal architecture and composition. Results reveal distinct features of crustal structures across Red River shear zone. The Moho depth is ranging from 28 to 32 km, with an average of about 30 km. It deepens in the south of the Red River fault, but shallower and flater in the north. The V_p/V_s ratio is lower and stable values in the north of Red River fault but highly variable in the south, suggesting that the crust in the south of Red River fault might be effected by the interaction of micro blocks in Northern Vietnam which separated by the major faults (Ma River fault, Da River fault, Son La fault, Red River fault). The shear wave velocity profile pointed out a sharp variation of the lower crust and uppermost mantle beneath the Red River shear zone, suggesting that the Red River shear zone is a lithospheric structure.

Keywords: Red River shear zone, Receiver Function, Crustal Structure, Seismic Linear Array across Red River shear zone