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Crustal seismic structure of Red-River shear zone and surrounding area

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The collision between the Eurasian and Indian plates since about 65 Ma caused extensive deformation in the Tibetan Plateau and surrounding areas. Northern Vietnam located in the southeastern Himalayan syntaxis is directly influenced by the collision and extrusion through the Red River shear zone that runs from southeastern Tibet to the South China Sea. Knowledge of crustal structure characteristics in northern Vietnam and across the Red River shear zone is crucial to improve our understanding not only of seismic hazards in the region but also of the regional Himalayan tectonic evolution as a whole. Seismic tomography is one of few methods that allows to study the subsurface structures effectively. In this study, we perform a joint tomographic inversion for northern Vietnam integrating the P- and S-direct waves traveling in the crust and the head waves along the Moho waves arrival time from more than 1000 earthquakes observed by Vietnamese networks. The obtained velocity model shows a good correlation with shallow geological features but also some complexity at crustal-scale. Several velocity anomalies bounded by and across the fault zones are revealed and discussed

Keyword: Traveltime tomography, Northern Vietnam, VpVs ratio, crustal structure, Vietnam seismic network