Velocity structure of uppermost mantle from Pn tomography beneath the southeastern margin of the Tibetan Plateau

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Since the late Cenozoic, structural deformation and seismic activity of the southeastern margin of Tibetan Plateau have become very strong. The southeastern margin of the Tibetan Plateau is characterized by strong seismicity and crustal deformation. It is an ideal region to investigate the lateral growth of the plateau and southeastward escape of the crustal material. The velocity structure and anisotropy of the uppermost mantle are important constraints on the crustal and mantle rheology.The Pn phases, which propagate along the bottom boundary of Moho, are critical information to study the velocity structure and anisotropy of the uppermost mantle.
In our work we have selected travel times of Pn arrivals as reported in the Annual Bulletin of Chinese Earthquakes(ABCE) and regional seismic network of provinces. A two-dimensional tomography method is employed to find regional variation of Pn velocity in the uppermost mantle beneath the southeastern margin of the Tibetan Plateau. In the most study area 2 degrees are well resolved.The main results show the relations of Pn velocity variation to regional tectonic structure, Moho depth and earth’s heatflow. Pn velocity structure is close to the regional tectonic structure: Low Pn velocities are found on the intense tectonic activity area, such as the west of SiChuan-YunNan block . High Pn velocities are on the tectonic stability area,beneath SiChuan Plain. Quantitative analysis result indicates that Pn velocity is positively correlated with crust thickness and negatively correlated with Earth’s heatflow.
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