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Crustal heterogeneity and Azimuth Anisotropy beneath West Qinling region from ambient noise by dense seismic array

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From one-year seismic ambient noise data recorded by the dense movable seismic array in West Qinling area, we picked up the Rayleigh wave phase velocity dispersion curves by the cross-correlation method, and obtained phase velocity distribution and azimuth anisotropy of different periods by surface wave tomography. The results show that the significant lateral variations of the crustal velocity structures are controlled by West-Qinling faults and Bailongjiang faults, which are the main tectonic boundaries in the study area. However, the shallow and deeper crust structures are related to the surface faults in different ways, respectively. It shows the northeastward structure in the shallow crust with lower velocity in the northwest part and higher velocity in the southeast part. And the velocity variations in the deeper crust indicate the northwestward structure. The distinct changes of crustal thickness are also related to the main tectonic boundaries. Across the West-Qinling faults, it shows that the Moho depth varies almost 10km. Our results suggest that West-Qinling faults and Bailongjiang faults are able to control the whole tectonic structure in different depths of the crust. Below southwest of the study area, which is in the plateau of Songpan, the low velocity distribution is consistent with the southern Songpan.