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# Shear-wave velocity structure beneath the central Tien Shan from seismic ambient noise tomography

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**Abstract** A new shear-wave velocity model of the central Tien Shan is determined using seismic ambient noise tomography. Continuous seismic data are used to generate the three-dimensional shear-wave velocity structure. These data are recorded at 38 broadband seismic stations from the GHENGIS and KNET seismic networks in the central Tien Shan during June 1999 and August 2000. Our new tomographic model reveals prominent lateral heterogeneities in the central Tien Shan region. The shallow structure beneath the central Tien Shan shows a good spatial correlation with surface tectonics. Low- and high-velocity anomalies are imaged beneath basins and surrounding mountain ranges, respectively. Most large earthquakes are mainly distributed in the low-velocity anomalies or the transition zones from high- to low-velocity anomalies, suggesting most large earthquakes are not only associated with active faults but also related to the low-velocity anomalies. Pronounced low-velocity anomalies are imaged in the middle crust beneath the high-elevated mountain ranges, whereas a reverse structure can be seen beneath low-elevated basin