

P and S wave tomography of the central Tien Shan from inversion of local earthquake arrival time data

Detailed tomographic images of the crust under the Central Tien Shan, Kyrgyzstan, are determined by using P and S wave arrivals data from local earthquakes and applying tomography method. The Tien Shan is one of the tectonically and seismically active intracontinental mountain ranges in the world sandwiched between stable areas, Kazakh Shield to the north and Tarim Basin to the south. The tomography method by Zhao et al. (JGR, 1992) has been used in this study. We selected earthquakes as uniform as possible in the study area. Most of the earthquakes are located at depths of 0-20 km. We set all layers of grid net up to 65 km in the upper and lower crust with a spacing of 5 km and 10 km, respectively. The Moho discontinuity is set at a depth of 50 km. The spacing between grid nodes is 0.3-0.5 degrees in horizontal direction. The study area is characterized by an alternation of high-V and low-V layers beneath ranges and basins. The tomographic results exhibit considerable amount of crustal heterogeneities, which confirms the tectonic complexities of the study area. Earthquakes are located either in or on the edge of low-V layers in the Tien Shan, respectively.

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