Crustal and Upper Mantle Structures in the eastern margin of Tibetan Plateau by using ChinArray Data

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The China Seismic Array (ChinArray) Program is to image the crust and upper mantle structures and their relationship to seismic activity in the mainland of China. The first two phases of the Program was completed in the eastern margin of the Tibetan Plateau in 2016. By using the seismic imaging methods, we want to explore the relationship between the Plateau and surroundings blocks, and to learn more about background structures where the strong earthquake occurred. The seismic array in this region includes 1174 broadband portable seismic stations, with the station spacing of 35km and two years observed period. By using the data of the seismic array stations, we inversed the 3-D seismic velocity structure, the shape of the Moho discontinuities and the seismic anisotropy of the lithospheric medium in the research area. The low velocity zone in the lower crust was founded inside the Plateau area. The depth of the Moho was obtained from the seismic receiver function. They showed the detailed variation of the Moho discontinuity in the eastern margin of Tibetan Plateau. The velocity structure results showed that the Red River fault is the border of the blocks in crust, while it has no remarkable variation in mantle beneath the fault. The bottom of Alasan block might be affacted by the extrusion of the northeastern margin of the Tibetan Plateau. The seismic anisotropy figure showed that the directions of the splitted fast S waves are changed near the latitude of 26°N in southeastern margin of Tibetan Plateau. The seismic anisotropy in northeastern margin of Tibetan Plateau also show the complex deformation figure caused by the process between Tibetan Plateau and surrounding blocks. These results could be used to build the lithospheric 3-D velocity model in the eastern margin of Tibetan Plateau.#