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P-wave velocity structure under Tibetan plateau revealed by seismic tomography

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For better understanding the evolution of the Tibet and formation of north-south trending rifts, many geophysical studies have been done and many explanations have been carried out. But due to the lack of data, the velocity structure under Tibet, especially in the western Tibet, is not very clear. By using the new datasets collected from Tibet, our results reveal that: 1) We found that the Indian lithosphere is reaching progressively further to the north from east line (along 87°E) to the west line (along 80°E), the same as some previous results. 2) Two prominent high velocity anomalies were detected beneath the southeastern and northeastern Tibet, and we interpreted them as the Indian and Asian lithospheric mantle, respectively. Additionally, a strong low velocity zone between the two lithospheric mantles was suggested as mantle diapir. 3) Along the central (85°E) and east line, the mantle upwelling (caused by the delamination of Indian plate) made the Indian plate subduction not continuous well (or even a break) under Indus-Tsangpo suture, and the formation of active rifts (e.g. Lopukangri rift) at this region is related to the mantle upwelling. 4) The pattern of crustal flow in eastern Tibet is complex.