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# Regional Flow in the Lower Crust and Upper Mantle under the Southeastern Tibetan Plateau

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## ABSTRACT

Seismic tomography reveals an "R-shape" regional flow constrained between the depths of 50 to 80 km in the Southeastern Tibetan Plateau (STP) which demonstrates some of the differences revealed by the magnetotelluric (MT) soundings in some areas. The "R-shape" flow could be present in both the lower crust and uppermost mantle, but not in the lower crust above the Moho discontinuity. Lateral flow has been imaged under the Qiangtang and Songpan-Ganzi blocks while two channel flows have been revealed beneath the south part of the STP with the eastward lateral flow from the Qiangtang block separating into two channel flows. One branch turns southwards at the south Qiangtang block, along the Bangong-Nujiang fault reaching to the Indochina block, and another is across the Songpan-Ganzi block (fold system) which then separates into northward and southward parts. The northward branch is along the edge of the north Sichuan basin reaching to the Qingling fault and the southward channel turns south along the Anninghe fault, then turns eastward along the margins of the south Sichuan basin. Our study suggests that the crustal deformation along the deep, large sutures (such as the Longmen Shan fault zone) is maintained by dynamic pressure from the regional flow intermingled with the hot upwelling asthenosphere. The material in the lower crust and uppermost mantle flowing outward from the center of the plateau is buttressed by the old, strong lithosphere that underlies the Sichuan basin, pushing up on the crust above and maintaining steep topography through dynamic pressure. We therefore consider that the "R-shape" regional flow played a key role in the crustal deformation along the deep suture zones of the Bangong-Nujiang, the Longmen-Shan faults, and other local heavily faulted zones.

## KEYWORDS

Regional Flow, Channel Flow, Crustal Deformation, Deep and Large Suture

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