

Uplift mechanism of the world's largest continental plateau in Tibet

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The uplift of the world's largest continental plateau in Tibet has been an intriguing phenomenon with various models to explain its deformation and uplift. Here I investigate the mantle dynamics beneath this region, based on teleseismic data recorded by temporary and permanent seismic stations. The results from my tomography suggest large-scale upwelling asthenosphere which correlates with the break-off of the subducted slab, combined with delamination. The upwelling asthenosphere provides enhanced heat at the base of the crust, leading to more ductile or more easily deformable lower crust in Tibet. Due to three large-scale low-velocity structures that almost cover an area of 80 km depth section, I consider that a rigid lithosphere is absent beneath Tibet, resulting in a more ductile lithosphere. Along the northward movement or subduction of the Indian plate, the lower crust on the ductile upper mantle generated deformation and was thickened in Tibet that led to the construction of the highest continental plateau in Tibet, which may be the uplift mechanism of the Tibetan Plateau.