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Responding to the Indo-Asian collision: from the crust to the mantle

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The collision and continued convergence between the Indian and the Eurasian plates in the past 50 million years or so has controlled the tectonic evolution in much of central and eastern Asia. Most studies have focused on the response of the crust or lithosphere to the collision; the role of mantle flow within the asthenosphere remains controversial. Some workers have suggested large-scale eastward and southeastward mantle flows driven from the collision zone, similar to the crustal motion; others have emphasized vertical mantle flows arising from convective downwelling under northern Tibetan Plateau and asthenospheric upwelling in eastern Asia above the subduction zones. In this talk we will integrate evidence from seismology, crustal kinematics, and geology to constrain the dynamic response of the crust, mantle lithosphere, and the asthenospheric mantle to the Indo-Asian collision. We will show that crustal deformation in central and eastern Asia is largely controlled by the Indo-Asian collision, but mantle flow under these regions are more complicated and likely involves both extrusive flow from the collision zone and convective flows above subduction zones in eastern Asia.

