



The Central Eurasia collision zone: insights from a neotectonic study

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In this study, we explore the neotectonic deformation in the whole Central Eurasia, including both the India-Eurasia and the Arabia-Eurasia collision zones, by using the thin-sheet approach in which the lithosphere strength is calculated from the lithosphere structure and thermal regime. We investigate the relative contributions of the lithospheric structure, rheology, boundary conditions, and friction coefficient on faults on the predicted velocity and stress fields. The resulting models have been evaluated by comparing the predictions with available data on seismic deformation, stress directions and GPS velocities. A first order approximation of the velocity and stress directions is obtained, reproducing the counter-clockwise rotation of Arabia and Iran, the westward escape of Anatolia, and the eastward extrusion of the northern Tibetan Plateau. To simulate the observed extensional faults within Tibet a weaker lithosphere is required, provided by a change in the rheological parameters or a reduction of the lithosphere thickness in NE-Tibet. The temperature increase generated by the lithospheric thinning below the Tibetan Plateau would also allow reconciling the model with the high heat flow and low mantle seismic velocities observed in the area. Besides the large scale, this study offers a coherent result in regions with little or no data coverage, as in the case of the Arabia-India inter-collision zone, over large areas of Pakistan and entire Afghanistan.

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