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The elastic thickness structure of the India-Eurasia collisional system; recovery and significance.

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Bouguer gravity anomaly and topography data have been used to determine the spatial variation in the elastic thickness (Te) structure of the India-Eurasia collisional system. An iterative, non spectral, method was applied that produced a high resolution, map of the Te structure. This method is based on a finite difference model for flexure below a load on an elastic plate of varying rigidity. This map can be subsequently correlated with regional geology.

The results of this method show large variations in Te along strike in the foreland, over the Indian peninsula and Tibetan plateau. Values range from ~0 km over the Tibetan plateau and in the Deccan volcanic region to ~125 km in the Himalaya foreland region. Te variations can be shown to correlate with known geological provinces in the region. Regions of low Te are predomintally areas of high seismic intensity and faulting, while regions of high Te correlate with stable cratonic fragments.

The south eastern margin of the Tibetan plateau appears to be weak and supported in an Airy type manner. This supports the hypothesis that the topography in this region is generated by some form of mid/lower crustal flow. Simple mass balance calculations, and the rate of Indian indention can then be used to place limits on the timing of the topographic development of this region.