

Lithospheric-mantle thinning beneath the Alpine-Himalayan Belt. Influence of mantle dynamics on tectonic evolution from geodynamic modelling
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The Alpine-Himalayan belt stretches from the Iberian Peninsula to Southeast Asia and is the result of closure of the Tethys Ocean and continental collision between the Eurasian plate and African, Arabian and Indian plates. Some anomalous chains located along this belt have been proposed as thinned lithospheric mantle (e.g. Atlas and Zagros Mountains, Tibetan Plateau). The slight crustal thickening and high topography, the presence of Cenozoic alkaline volcanism and the interpretation of geopotential fields support the hypothesis of a remarkable lithospheric thinning below the Atlas Mountains. Beneath the Zagros Belt a lithospheric mantle thinning is needed in order to fit elevation, geoid, gravity and thermal data. Uplift late in the tectonic evolution of the Tibetan Plateau, the widespread extension, and the associated magmatism have been attributed to removal of the lower part of the lithospheric mantle and its replacement by hotter and lighter asthenosphere, a two-dimensional lithospheric thermal and density model of the present day structure and numerical modeling of the evolution of the Plateau supports this interpretation. Despite all the studies carried out in these orogens, there is still much debate on the respective chronologies of uplift, the mechanisms responsible, and the present orogenic structure. This presentation will show the influence of lithospheric mantle thinning beneath a compressional mountain belt on topography, surface deformation and drainage pattern.