



3D Mechanical structure of the lithosphere below the Alps and the role of the gravitational body forces in the regional stress field

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We developed a 3D rheological model to analyze the rheological stratification of the lithosphere in the Alpine region. Our analysis reveals a strongly heterogeneous lithosphere strength characterized by steep strength gradients across the Periadriatic Lineament and the occurrence of non-competent crustal layers located below the northern Alps, where the upper crust is effective in determining the total lithosphere strength.

The predicted lithosphere strength is then included within a spherical thin sheet model to investigate the propagation of the compressive stresses originated at the Africa-Eurasia convergence boundary. Our analysis shows that the compressive stress propagates up to the Periadriatic Lineament but might be partially or totally absorbed before reaching the shallower depths in the Eastern and Western Alps, where the style of local deformation is mainly controlled by gravitational body forces.