

Effect of continents on mantle dynamics for various mantle rheologies

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Continents can be seen as passive rafts at the surface at the mantle, while the oceanic lithosphere is continuously recycled through subduction, and can be considered as the upper thermal boundary layer for mantle convection.

Continents however participate in mantle convection by imposing specific thermal and mechanical boundary conditions, whose effects are studied here with two-dimensional numerical experiments. We study the influence of the rheological parameters of the mantle on its response to the boundary conditions set on top of the mantle.

These preliminary results indicate that the lateral heterogeneities in the temperature field, induced by the presence of continents, can help generating plate tectonics.