



strain localisation in long term tectonic model of strike slip tectonics: how does it differs from dip-slip ?

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How lithospheric strike slip faults form and deform constitutes a frontier topic in term of numerical modelling and better understanding their formation should bring new constrained on so debated the rheological stratification of the lithosphere. Indeed, most of what has been learn on the rheology of the lithosphere from long-term thermo-mechanical modelling is the result of thourough studies of 2D continental rift system, basins and 2D subduction and collision system.

In all the case, the faults and shear zones which localizes the deformation are perpendicular to the rheological stratification of the lithosphere and therefore sample the strong and viscous layers of the lithosphere in serial. Lithospheric strike slip faults sample the rheological stratification in parallele and as a result the effective rheology of strike slip faults cannot be similar to the effective rheology of dip-slip faults.

I will present a synthesis of results obtain using different initial and boundary conditions (transtenion, transpression, initial oblique weak zone) representative of different strike slip system in the world. All these models produce localization and large strain on strike slip faults after a phase of structural weakening.

The models show that in order to accommodate large displacement on strike slip faults severe weakening of the mantle lithosphere need to be involved. Mechanism that allows the strength to drop are several but the final rheological structure of the model is always the same a weak vertical zone surrounded by stronger lithosphere.