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Subduction initiation in the Neotethys: from field evidences to numerical modelling

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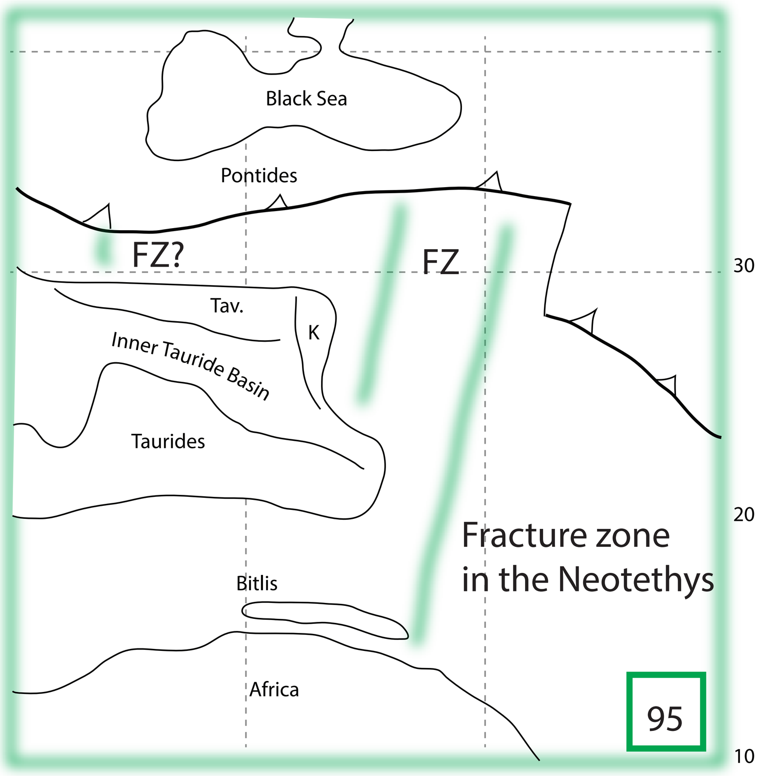
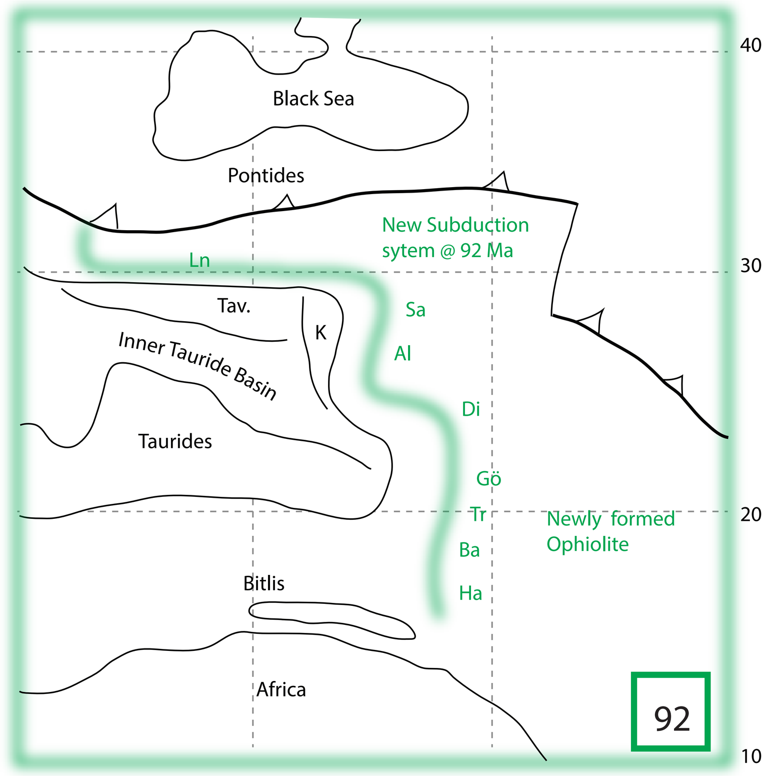
{Introduction}

Subduction initiation is an unresolved question of plate tectonics. Few models have been proposed (either conceptual of physical; *e.g.* Stern 2004; Maffione et al., 2015; Leng & Gurnis 2015).

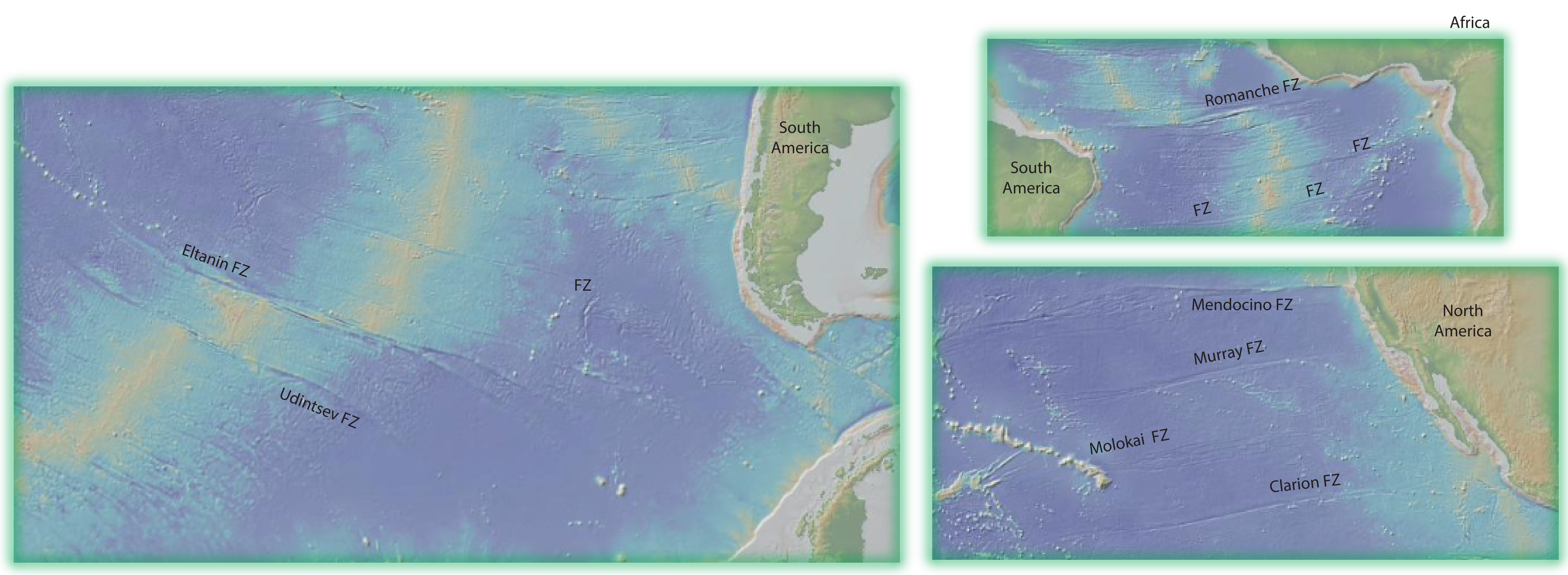
My approach

Here I chosed to test wether it is possible to initiate subduction at fracture zones. Why? Because we have evidences that the ridge was gone since *ca.* 110 Ma in the Neotethys (in Turkey) where I did most of my previous work.





Present day configuration



Fracture zone are comon objects. Average width is about 20 km and can go up to 100 km when there are close fracture zones (Romanche fracture zone for example).

Difference in age typically varies from 10 to 50 My.

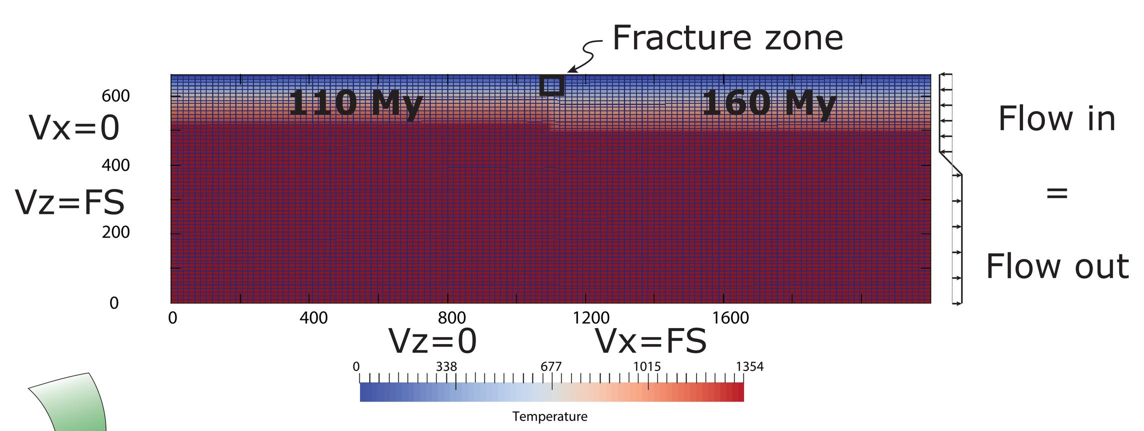
{ELEFANT} (Thieulot, 2014)

Finite element thermomecanically coupled code

Temperature profile of a *ca.* 110 vs. 160 My old oceanic lithosphere. Computed as a semi-infinite half-space.

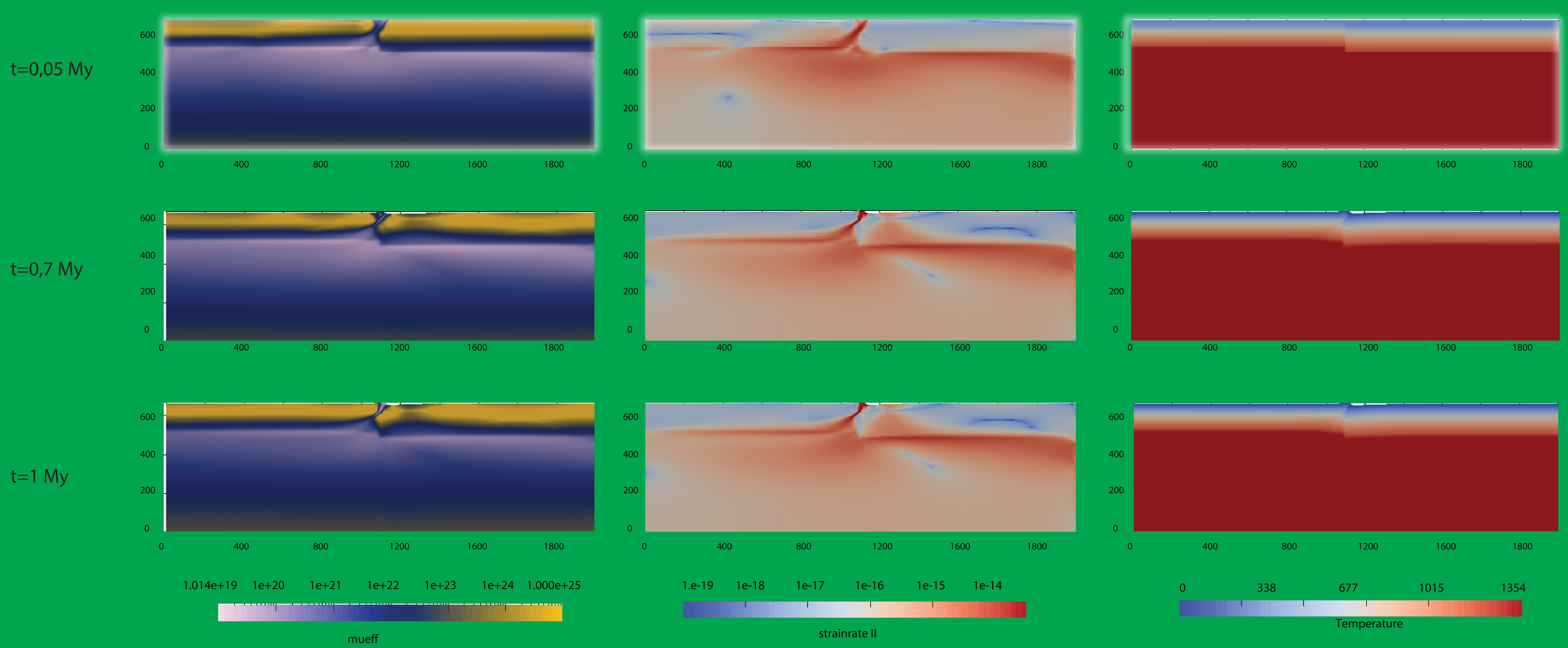
Material: olivine with a non Newtonian and temperature dependant viscosity following Karato & Wu (1993)

$$\mu_{eff} = f \frac{1}{2} A^{\frac{1}{n}} \dot{\varepsilon}_{II}^{(\frac{1}{n}-1)} \exp\left[\frac{Q+PV}{nRT}\right]$$



{Preliminaryresults}

Subduction initiation at transform zones is possible!!!



To be tested

- Possibility to form metamorphic sole
- Influence of shear heating
- Half out flow on the other side of the domain
- Mesh refinement
- Increased resolution

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