



numerical investigation of the onset of collision in Iran

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Despite a wealth of subduction modelling performed over the last 15 years, very little is known about the dynamics of ocean closure. One can a priori imagine very different scénarios: subduction might stop when the ocean ridge "collides" with the continent (whether or not it has stopped functioning prior to approaching the subduction zone?) and later resume; a new subduction could also initiate at the ridge or elsewhere in the ocean, as a result of changing the overall force balance of convergence (e.g. Seton et al. 2015), thereby triggering obducting of lithospheric material. Very little modelling of these processes exists at present (e.g. Martinod et al. 2005, Burkett and Billen, 2010.).

Here we intend to gap in our dynamic understanding of the end of subduction using thermo--mechanical modelling. We study systematically how changes in plate kinematics prescribed on a continental plate surrounding an oceanic domain, made of a ridge and a subduction zone, impact the dynamics of the system in 2D.

The models are than compared to case studies of Sistan (i.e. using the Arabia--Eurasia convergence transect) in term of upper plate deformation in order to better understand how changes in plate dynamics may have affected the exhumation and overall kinematics of these suture zones.

Having remained on the edge of the Eurasian upper plate during much of the subduction- then collision-related Meso/Cenozoic history, Central Iran provides a continuous geological record of convergence and closure of the Neotethyan realm (Agard et al. 2011) providing good constrains to understand the long-term mechanical coupling between plates and how this coupling relates with the magmatic evolution, which represent a prominent contribution to the mineral resources of Iran.

This study take advantage of newly implemented mesh refinement and effective parallel numerical implementation of pTatin2D, This permits to have extremely high resolution on the déformation of the plate interface and the crust and at the same timemake sure boundary conditions are apply far enough not to affect the local dynamic of the system.