

Thermomechanical modeling of the impact of structural inheritance on the distribution of the deep basins in the Alboran Sea

*Laetitia Le Pourhiet*¹, *Riadh Labayed*¹, *Jeroen Smit*¹, *Dave May*²

¹ *ISTEP - UPMC Case 129, 4 place Jussieu, 75005 – Paris France,*

² *GFD – ETH- Department of Earth Sciences, Sonneggstrasse 5, 8092 Zurich Switzerland*

laetitia.le_pourhiet@upmc.fr

The Alboran basin is a typical basin of the Mediterranean area in the sense that rapid extension has been followed by shortening without letting the time for the thermal structure of the basin or the weak lower crust underneath to relax. The Alboran basin is however special because of the very deep (10km) basins and the very tortured structure of the basements that features a multitude of accidents at short wavelength. Whether these accidents correspond to primary structures related to the formation of the basins or were acquired later is important for hydrocarbon potential.

In this study, we are using top of the art academic thermo-mechanical modeling software to understand the effect of the lower crustal rheology and the timing of the inversion on the structure that form during early inversions in 3D.

We will present first the modeling assumption and the result of a parametric approach assessing in particular the evolution of subsidence rates and heat flow with time in the main basin as a function of the parameters but also as a function of the final structure which is at the end the primary observable as Today. In a second part, we compare some of the model to the sea of Alboran and propose a model for the structural and thermal evolution of the basin.