

COUPLED SURFACE and MANTLE PROCESSES in the CENTRAL MEDITERRANEAN

COMSURF team: Evgueni BUROV¹, Christian GORINI¹, Didier GRANJEON², François ROURE^{2&3}, Sierd CLOETINGH³, Belkacem ADDOUM⁴ and Piero CASERO⁵

1 ISTEP, UPMC, Paris, France

2 IFP-Energies Nouvelles, Rueil-Malmaison, France

3 VU-Amsterdam, the Netherlands

4 Sonatrach, Boumerdes, Algeria

5 Consultant, Rome, Italy

Corresponding author: Francois.Roure@ifpen.fr

The Ionian basin in the Eastern Mediterranean and the Sicilian-Tunisian-North Algerian foothills and foreland constitute two important segments of the former passive continental margin of Africa, which have been strongly impacted by Late Cretaceous and Cenozoic episodes of compressional inversion.

These two domains share the same overall paleogeographic evolution and structural grain, inherited from former Permian-Triassic and Jurassic rift structures, with a major erosional unconformity at the base of the deep water Neogene flexural sequence sealing underlying Late Cretaceous and Paleogene inverted features. However, they differ strongly by their current bathymetry and topography. For instance, Langhian turbidites cropping out near Tiaret in the Tellian foreland in North Algeria are currently located at 1km above the sea level, whereas coeval Miocene sequences are still located at about 4km below the sea level in the Ionian deep abyssal plain.

These rapid lateral changes observed in the vertical motion in the African foreland can be explained by the change from episodes of active subduction roll-back of the infra-continental lithospheric mantle associated with a delamination of the crust still operating in the Calabrian-Apenninic and Aegean arcs, to episodes of slab detachment, unflexing and exhumation in the Maghrebides and adjacent atlasic foreland.

Because of the excellent control provided by the sedimentary records imaged by seismic reflection profiles in the sink areas (Ionian abyssal plain, Sicilian-Tunisian channel, Hodna and Chelif basins, Algerian offshore), and by paleo-thermometers such as Ro, Tmax and AFT in the source areas (Tell, Sicily, Calabria, Apennines), we have selected these two very active geodynamic domains to test the coupling of geodynamical (Paraschov) and sedimentological (Dionisos) numerical tools, which will be the aim of our forthcoming Comsurf project.