



The Minorca Basin: a buffer zone between the Valencia and Liguro-Provençal Basins (NW Mediterranean Sea)

Romain Pellen (1), Daniel Aslanian (2), Marina Rabineau (1), Estelle Leroux (2), Christian Gorini (3), Carmine Silenziario (4), Christian Blanpied (5), and Jean-Loup Rubino (5)

(1) CNRS, UMR6538, Géosciences Océan, IUEM-UBO, Plouzané, France (Romain.Pellen@ifremer.fr; marina.rabineau@univ-brest.fr), (2) IFREMER, Centre de Brest, GM-LGS, Plouzané, France (Daniel.Aslanian@ifremer.fr; Estelle.Leroux@ifremer.fr), (3) UPMC, Univ. Paris 06, UMR 7193, ISTEP, Paris, France (christian.gorini@upmc.fr), (4) Schlumberger House, West Sussex, England (CSilenziario@slb.com), (5) TOTAL, TG/ISS, CSTJF, Pau, France (Christian.BLANPIED@total.com; jean-loup.rubino@total.com)

The present-day compartmented Mediterranean physiography is inherited from the last 250 Ma kinematic plate evolution (Eurasian, Africa, Iberic and Nubia plates) which implied the formation of orogenic chains, polyphased basins, and morphological - geodynamic thresholds.

The interactions between these entities are strongly debated in the North-Western Mediterranean area. Several Neogene reconstructions have been proposed for the Valencia basin depending of the basin segmentation where each model imply a different subsidence, sedimentary, and palaeo-environmental evolution. Our study propose a new kinematic model for the Valencia Basin (VB) that encompasses the sedimentary infill, vertical movement and basin segmentation.

Detailed analyses of seismic profiles and boreholes in the VB reveal a differentiated basin, the Minorca Basin (MB), lying between the old Mesozoic Valencia Basin *sensu stricto* (VBss) and the young Oligocene Liguro-Provençal Basin (LPB) (Pellen et al., 2016). The relationship between these basins is shown through the correlation of four Miocene-to-present-day megasequences. The Central and North Balearic Fracture Zones (CFZ and NBFZ) that border the MB represent two morphological and geodynamical thresholds that created an accommodation in steps between the three domains. Little to no horizontal Neogene movements have been found for the Ibiza and Majorca Islands and imply a vertical “sag” subsidence. In contrast, the counterclockwise movement of the Corso-Sardinian blocks induced a counterclockwise movement of the Minorca block towards the SE along the CFZ and NBFZ, during the exhumation of lower continental crust in the LPB. The South-Eastward Minorca block translation stops when the first atypical oceanic crust occurs. The influence of the Neogene Betic compressional phase is thus limited to the VBss on the basis of a different MB origin.

This new understanding places the AlKaPeCa blocks northeastward of the present-day Alboran Area. Both NW-SE and NE-SW Neogene blocks rotation proposed in earlier studies are therefore questioned (Pellen et al., 2016). A better kinematic understanding of the NW Mediterranean area is possible through the study of the South Balearic margin and Algerian basins.

Pellen, R., Aslanian, D., Rabineau, M., Leroux, E., Gorini, C., Silenzario, C., Blanpied, C., Rubino J-L., 2016. The Minorca Basin: a buffer zone between Valencia and Provençal Basins, *Terra Nova*. doi: 10.1111/ter.12215