Geophysical Research Abstracts
Vol. 18, EGU2016-7618-1, 2016
EGU General Assembly 2016


# The deep Ionian Basin revisited

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The deep Eastern Mediterranean Basins (Ionian and Herodotus) are characterized by thick sedimentary sequences overlying an extremely thinned basement evidenced from different geophysical methods. Yet, the nature of the crust (continental or oceanic) and the timing of the extreme crustal and lithosphere thinning in the different sub-basins remain highly controversial, casting doubts on the tectonic setting related to the formation of this segment of the North Gondwana paleo-margin.

We focus on the Ionian Basin located at the western termination of the Eastern Mediterranean with the aim of identifying, characterizing and mapping the deepest sedimentary sequences. We present tentative age correlations relying on calibrations and observations from the surrounding margins and basins (Malta shelf and Escarpment, Cyrenaica margin, Sirte Basin, Apulian Platform). Two-ship deep refraction seismic data (Expanding Spread Profiles from the PASIPHAE cruise) combined with reprocessed reflection data (from the ARCHIMEDE survey) enabled us to present a homogeneous seismic stratigraphy across the basin and to investigate the velocity structure of its basement.

Based on our results, and on a review of geological and geophysical observations, we suggest an Upper Triassic-Early Dogger age for the formation of the deep Ionian Basin. The nature of the underlying basement remains uncertain, both highly-thinned continental and slow-spreading type oceanic crust being compatible with the available constraints. The narrow size and relatively short-lived evolution of the Ionian Basin lead us to suggest that it is more likely the remnant of an immature oceanic basin than of a stable oceanic domain. Eventually, upscaling these results at the scale of the Eastern Mediterranean Basins highlights the complex interaction observed between two propagating oceans: The Central Atlantic and Neo-Tethys.