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The offshore extent of the Jabal Al Akhdar anticline (Cyrenaica, Libya): timing of development and influence on the geometry of the Mediterranean ridge.

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Cyrenaica (Libya) forms an important promontory belonging to the margin of the Eastern Mediterranean Sea interpreted as a vestige of the Mesozoic Neo-tethys. Within Cyrenaica, the Jabal Al Akhdar anticline is a NE-trending inverted structure reaching an elevation of 880 meters. Using elevation and gravity maps, combined with onshore mapping and seismic lines offshore, we are able to demonstrate that this anticline extends further toward the north-east in the Eastern Cyrenaica offshore domain. Industrial seismic profiles across the off-shore prolongation of the anticline and partly well-calibrated allow us to precise the timing of the main tectonic events. A strong pre-Oligocene unconformity post-dates the main folding event. Just below, growth strata within the top-Ypresian to top-Priabonian deposits sign a continuous activity during the Middle-Late Eocene. A comparable configuration can be depicted from the geological record in the onshore domain. At depth, a third unconformity within Upper Cretaceous levels could indicate the first event of folding recognized onshore. The southern front of the Mediterranean Ridge, the accretionary prism related to the Hellenic subduction, marks a pronounced re-entrant at the margin where it reaches the anticline. This suggests that the Jabal Al Akhdar forms currently a buttress in front of the propagating prism. The obliquity of the structure, and its age, raise questions about the role of the structural heritage in the processes leading to the inversion of the East-Mediterranean southern margin.