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Late Mesozoic – Cenozoic evolution of the eastern Cyprus offshore

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The present-day tectonic setting of the Eastern Mediterranean Sea results from a long deformation history, characterized by an alternation of extensional and contractional phases: from Mesozoic rifting to Late Cretaceous-present-day compression. This study focused on the tectonic reconstruction of the north-eastern side of the Mediterranean Sea, on a sector located between the Turkish coast and the northern Levantine Basin, using seismic reflection profiles. Previous studies dealt with the recent (Neogene) evolution because they did not have enough depth of investigation to recognize deeper reflections. We used vintage data such as MS and Strakhov surveys to analyze the deeper part of the area. We interpreted and depth-converted these seismic data, and we developed a sequential restoration to reconstruct the stratigraphic and structural evolution of the study area.

In general, from north to south, we recognize the Cilicia Basin: a piggy-back basin bordered to the south by the offshore continuation of the Kyrenia Range. The Kyrenia Range is a positive flower structure generated during a transpressional phase because of the rotation of the Arabic plate. Southward, a secondary contractional system with an overlapping wedge is present in the area between the Kyrenia Range and another prominent ridge, i.e. the Larnaca Ridge. In the southern part, the same transpressional phase that generated the Kyrenia Range led to a positive inversion of an ancient extensional system, i.e. the Latakia Ridge. Beyond these positive flowers, the Levantine Basin is affected by extensional structures showing weak positive reactivation, including halokinetic features.

In summary, we found that the inherited extensional structures strongly impacted the following contractional ones affecting both their geometry and their kinematics.