# Structural styles and tectonic evolution of the Romanian Black Sea

Corneliu Dinu [a]*, Dorina Tambrea [b], Ioan Munteanu [a]

[a] Faculty of Geology and Geophysics, Bucharest University, 6 Traian Vuia Str., 70139 Bucharest, Romania

[b] Danubian Energy Consulting, 2nd Silvestru Str., 6th Suite, 020735 Bucharest, Romania

Corresponding author: mailto:corneliu.dinu@g.unibuc.ro (Corneliu Dinu).

The Western Black Sea basin opened during Cretaceous times by back-arc rifting in association with a north dipping subduction at the rear of the Cretaceous–Early Tertiary Pontide volcanic arc. The sedimentary wedge developed on the shelf of the Romanian Black Sea sector reflects a complex interplay between large scale rifting, uplift of the orogenic flanks, large-scale post-rift subsidence and sea level changes. The evolution of the western Black Sea basin started in the Albian–Cenomanian times, when two extensional phases with significantly different directions (N–S and subsequently E–W) lead to the formation of a complex interplay between isolated blocks organised in horsts and grabens generally deepening south or eastwards. Superposition of normal faults footwall blocks from the two extensional episodes generated a deeply subsided area with enhanced accommodation space, i.e., the Histria Depression, and, consequently, recorded a larger thickness of Paleogene and Neogene sediments in the post-rift stage. (Re)activation of faults and associated folding reflects repeated inversion during the Late Cretaceous and Oligocene times, associated with a short period of extension in Eocene time when were formed small graben or demigraben filled with Eocene carbonate flysch deposits in northern flank of Histria Depression.

The period of evolution from Oligocene till present was considered by many authors like a quiet time interval in which the sedimentary basin was filled, we demonstrate that the filling was produce under differentiate subsidence and tectonic activity of different sectors, with specific structures.

The tectonic evolution of the Romanian Black Sea Offshore can be unravelled only by analysing the deformations observed in the tectonic units of the marginal continental basement, as well as the far-field structures controlled by the Alpine deformations of its flanking orogens. The pre-Alpine inherited structures in the surrounding mountain chains and adjacent platforms (East European, Scythian and Moesian) are equally important for the study of tectonic reactivations and the detailed structural geometry of the area.