Sequence stratigraphy of Miocene-Pliocene sediments, Romanian Black Sea self

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During the Paleogene–Pliocene, important deformation took place in the Alpine–Carpathians domain. The interplay between uplift of orogenic systems and subsidence in the closely related basins caused the separation of the Paratethys from the Mediterranean, part of the Tethys basin. During the Miocene, Carpathians tectonics induced a further fragmentation of the Paratethys, the Eastern branch ovelap on Dacic, Black Sea and Caspian basins. In these semi-isolated basins, which were occasional connected to the main Tethyan realm, marine to brackish or fresh water sediments containing endemic faunas were deposited. This makes the stratigraphic correlation difficult and sometimes ambiguous. The Neogene geochronology of Romanian Black Sea self it has the same stages as the Dacian Basin.

In the Black Sea, Neogene sea level fluctuations and Alpine tectonics are responsible for periods of massive sedimentation followed by sediment starvation and/or significant erosion, with important volumes of sediments being transported basinwards. As a result, the Neogene section on Romanian shelf debuts with Middle Miocene deposits. An important unconformity separates them from Oligocene ones, easily traceable on seismic lines.

Using sequence stratigraphy methodology applied on seismic section, correlated through wells; we identify six sequences in to Mio-Quaternary deposits, separated by sequence boundary. On the shelf area this boundaries have a clear erosional character, with numerous channel like features being develop. Seismic facies shows a good correlation between lithology and system tracts.

Important subsidence and eastward basin tilting took place after Middle Miocene times.

The Upper Miocene-Pliocene succession is affected by normal and thrust faults, due to gravitational sliding and expansion, which developed in two phases. Both of them seem to be related with see level drop, which induced slope instability and gravitational sliding with developing of normal faults and associated thrust fault. The first generation of faults seems to be related with sea level drop, during Messinian salinity crisis, since these faults are truncated under Upper Pontian/Middle Pontian unconformity, with important progradation took place afterword.
The second phase of normal faults seems to correlate with sea level drop during Pliocene times. The decolement surface can be trace into the lower Oligocene sediments, and probably on top of Upper Eocene shales. These gravitational faults are located just in the Northern part of Romanian shelf, where Mio-Pliocene deposits are thicker (also the subsidence is higher during this time).