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Mesozoic carbonate-siliciclastic platform to basin systems of a South Tethyan margin (Egypt, East Mediterranean)

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The Mesozoïc Egyptian margin is the south margin of a remnant of the Neo-Tethys Ocean, at the African northern plate boundary. East Mediterranean basin developed during the late Triassic-Early Jurassic rifting with a NW-SE opening direction (Frizon de Lamotte et al., 2011). During Mesozoïc, Egypt margin was a transform margin with a NW-SE orientation of transform faults. In the Eastern Mediterranean basin, Mesozoïc margins are characterized by mixed carbonate-siliciclastics platforms where subsidence and eustacy are the main parameters controlling the facies distribution and geometries of the platform-to-basin transition.
Geometries and facies on the platform-slope-basin system, today well constrained on the Levant area, where still poorly known on the Egyptian margin.
Geometries and stratigraphic architecture of the Egyptian margin are revealed, thanks to a regional seismic and well data-base provided by an industrial-academic group (GRI, Total). The objective is to understand the sismostratigraphic architecture of the platform-slope-basin system in a key area from Western Desert to Nile delta and Levant margin. Mapping of the top Jurassic and top Cretaceous show seismic geomorphology of the margin, with the cartography of the hinge line from Western Desert to Sinaï. During the Jurassic, carbonate platform show a prograding profile and a distally thickening of the external platform, non-abrupt slope profiles, and palaeovalleys incisions. Since the Cretaceous, the aggrading and retrograding mixed carbonate-siliciclastic platform show an alternation of steep NW-SE oblique segments and distally steepened segments. These structures of the platform edge are strongly controlled by the inherited tethyan transform directions. Along the hinge line, embayments are interpreted as megaslides. The basin infilling is characterised by an alternation of chaotic seismic facies and high amplitude reflectors onlaping the paleoslopes. MTC deposits can mobilize thick sedimentary series (up to 3500 m) as a mixed combination of debris flows, internal preserved blocks, and/or compressively-deformed distal allochthonous masses. Transported material have proceeded from the dismantling of the Mesozoic mixed carbonate-siliciclastic platform. They can spread down slope over areas as large as 70000 of km2. According to stratigraphic correlations with global sea-level positions, platform instability would have been triggered by the gravitational collapse of the carbonate-siliciclastic platform under its own weight after successive subaerial exposures which were able to generate karstification processes.
Seismic interpretation is constrained by a detailed assessment of the Egyptian margin paleogeography supported by wells. This margin segment is briefly compared to the outcropping Apulian margin in Italy.