



Multi-scale constraints of sediment source to sink systems in frontier basins: a forward stratigraphic modeling case study of the Levant region

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Recent scientific work underlined the presence of a thick Cenozoic infill in the Levant Basin reaching up to 12 km. Interestingly; restricted sedimentation was observed along the Levant margin in the Cenozoic. Since the Late Eocene successive regional geodynamic events affecting Afro-Arabia and Eurasia (collision and strike slip deformation) induced fast marginal uplifts. The initiation of local and long-lived regional drainage systems in the Oligo-Miocene period (e.g. Lebanon versus Nile) provoked a change in the depositional pattern along the Levant margin and basin. A shift from carbonate dominated environments into clastic rich systems has been observed.

Through this communication we explore the importance of multi-scale constraints (i.e. seismic, well and field data) in the quantification of the subsidence history, sediment transport and deposition of a Middle-Upper Miocene “multi-source” to sink system along the northern Levant frontier region. We prove through a comprehensive forward stratigraphic modeling workflow that the contribution to the infill of the northern Levant Basin (offshore Lebanon) is split in between proximal and more distal clastic sources as well as in situ carbonate/hemipelagic deposition.

In a wider perspective this work falls under the umbrella of multi-disciplinary source to sink studies that investigate the impact of geodynamic events on basin/margin architectural evolutions, consequent sedimentary infill and thus on petroleum systems assessment.