



## **2D deep cross-section of Mediterranean thrust belt, Messinian evaporitic seals and Shale diapirism (Sirt and Cyrenaïcan foreland basin, Libya)**

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The main aim of our current study is focused on processing and interpretation of multichannel seismic reflection data, recorded during MEDISIS and PRISMED cruises in the Sirt and Cyrenaïca foreland basin. By using time and depth migration, about 1749km of deep offshore profile was processed and allows us to map close to 40km of overthrust belt ahead of Cyrenaïcan platform. Interpretation of these seismic sections package highlights five litho-seismic layers around the prospecting area and two tectonic units through the accretionary complex: the Cretan toethrust and cyrenaïcan prism, which connect together by backthrusts. The deep of the mapping series exceed 4.5km upright deep-sea trench, and the velocity model of these sequence range from 1499m/s at the top of see-floor to 3556m/s at the substructure. The horizons identified may include Plio-Quaternary mudstones, Miocene salts, Base Oligocene unconformity, Eocene/Palaeocene system tracts and upper Cretaceous clastic rocks which are highly affected by extensional deformation. Subsurface controls of these deeper events are supported by previous studies and seismic patterns analysis. Characteristic features of Miocene imbricate slice include velocities gathering from 1681m/s at the top of the sequence, 4057m/s inside the unit and 1974m/s at the root. Intervals velocities inversions are evenly noted upon tortoise and shale forearc diapirics structures. The range values recorded throughout these prospects is 1754m/s, 1352m/s and 2256m/s according to depth. These variations of seismic attributes and theirs chaotic to reflection-free pattern shows would indicate trapping structures of lower sequences (Upper Cretaceous?) petroleum generation and migration. Our hypothesis is supported by evidence deep-sea flat spot and fluids migration clearly identified on seismic sections. Another

key of both structural and stratigraphic trap type is given by the presence of growth fault/rollover systems at the top of sedimentary cover. These backgrounds can provide issues for future oil and gas exploration in Sirt and Cyrenaican foreland basin.