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Interaction of Strike-Slip Faulting and Salt Wall Formation in the Katakolo area, NW Peloponnese, Greece

L. Gouliotis[1], G. Panagopoulos[1], K. Nikolaou[1], D. Anestoudis[1]
(1) Energean Oil and Gas S.A., Athens Greece, lgouliotis@energean.com

In this paper we integrate offshore and onshore data from the Katakolo area, NW Peloponnese, Greece, in order to examine the interaction of strike slip faulting and salt diapirism. Reprocessing of the legacy 3D seismic data in the offshore area show that the previously identified salt diapir (Monopolis & Armoutidis, 1983) is a narrow, elongated NNE-SSW to N-S trending salt wall that penetrates the Plio-Quaternary sedimentary rocks (Figure 1). The overburden adjacent to the salt structure is deformed by a series of NE-SW striking conjugate extensional faults. The later, close to the salt wall display a progressive ~20°-30° counter-clockwise rotation resulting in NNE-SSW strike which is consistent with a dextral shearing. Some faults show growth strata and listric geometry, while other are planar domino-style normal faults that root into deeper faults and the alpine rocks of the Ionian unit (Figure 1). In order to trace the northward continuation of the offshore faults we performed geological mapping in 1:5.000 scale at the Katakolo peninsula. We mapped two formations: i) The lower "Vounargos" formation and ii) the upper "Katakolo" formation (Streif, 1980). The contact between them is marked by an angular unconformity that can be nicely observed in the western part of the peninsula. The unconformity dips to the west-southwest and is submerged at the southern and southwestern part. The overall geometry of the Plio-Quaternary rocks shows that the whole peninsula is a fault block, tilted to the west-southwest and is bounded by a NNE-SSW trending fault at the southern part and an N-S trending fault at the eastern. Along these faults thermogenic gas seepages indicate connection with a deeper salt structure. Systematic fracture analysis on omnipresent extensional fracture sets from the Katakolo formation resulted in the calculation of the minimum horizontal stress that has a NW-SE strike, consistent with extension within a NNE-SSW trending dextral shear zone. From the geometry and the faulting pattern of the Plio-Quaternary sedimentary rocks in the offshore and onshore Katakolo, we conclude that the salt wall is supported by a deeper feeder and is formed along an active strike slip zone.

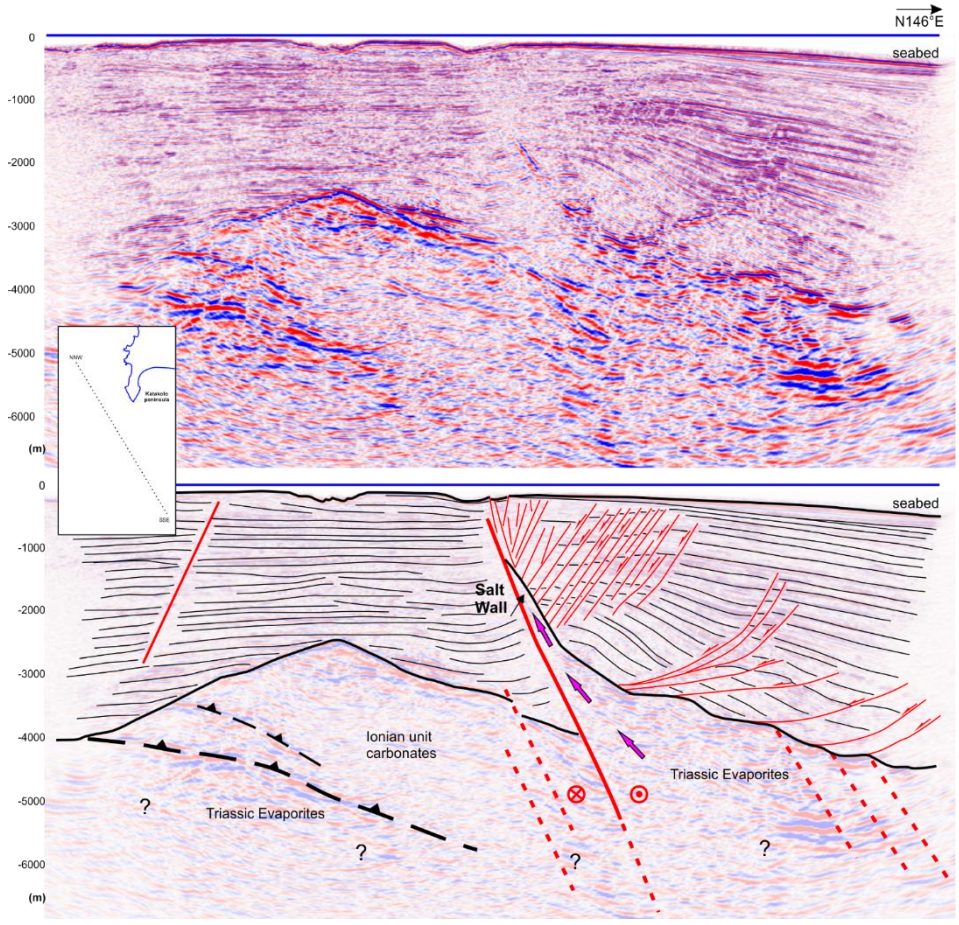

Figure 1. Seismic section (top) and Seismic interpretation (bottom) of the reprocessed pre-stack depth migrated (PSDM) legacy 3D seismic data from the offshore Katakolo area. 1) Dashed black lines - Early/Middle Miocene thrusts, 2) Solid thick black lines - Top of the alpine rocks of the Ionian unit, 3) Solid and dashed red lines – Plio-Quaternary faults and inferred continuation.

References

Monopolis, D., & Armoutidis, Ch., 1983. Evaluation of the Gas-Oil Field "West Katakolo", Provisional Geological Report, Public Petroleum Corporation of Greece S.A., Athens, Greece.

Streif, H., 1980. Geological map of Greece, scale 1:50 000, Pyrgos sheet, Institute of Geology and Mineral Exploration, Athens, Greece.