the offshore Essaouira/Safi segment show the presence of inverted structures in the ultra-deepwater area as well, outboard of the salt basin.

Deepwater exploration in NW Egypt: a case study of collaborative industry-academia efforts

TARI, G.[1], MASCLE, J.[2], NOVOTNY, B.[3], KOHAZY, R.[1] & KROIS, P.[1]

[1] OMV Exploration and Production, Vienna, Austria;
[2] Geosciences-Azur, Villefranche/mer, France;
[3] OMV Egypt, Cairo, Egypt

The deepwater Herodotus Basin of NW Egypt represents a very underexplored region of the eastern Mediterranean Basin to date. The Matruh Trough is located along this segment of the Egyptian offshore covering an area of about 10000 km^2. This trough, trending almost perpendicularly to the coastline, is located west of the Nile Delta province and north of the Western Desert and its offshore part extends across a relatively narrow shelf into the deepwater. OMV's Obaiyed Offshore block, covering most of the Matruh Trough, is considered as a prospective undrilled deepwater block down dip from the numerous gas and oil fields of the Western Desert petroleum province. Based on seismic reflection data sets, at least five other deepwater play types have been identified in the block. Most of them related to a large shale detachment system and therefore are considered unique to the Matruh Trough. Significant oil and gas shows from the onshore Mersa Matruh-1 well, located near the coastline, support the offshore extension of the Matruh Trough with a working petroleum system.
Academic research in the same deepwater area is focused on seafloor processes, including some presently active prominent mud-volcanoes detected by high-resolution swath bathymetric surveys. Comparing and merging the independent academic and industry data sets provided clear evidence for a an active deepwater petroleum system. The currently active mud-volcanoes are being fed from below the Messinian salt level and therefore these features prove the present-day generation of thermogenic gas in this part of offshore Egypt, similarly to the Nile Cone.

Definition of Top-Crystalline Basement in the Upper Austrian Molasse Basin

THÜRSCHMID, G.[1], SACHSENHOFER, R.F.[1] & TROISS, W.[2]

[1] Department of Applied Geosciences and Geophysics, Montanuniversität Leoben, Peter-Tunner-Str. 5, 8700 Leoben, Austria; gloria.thuerschmid@stud.unileoben.ac.at; reinhard.sachsenhofer@unileoben.ac.at;
[2] RAG Rohöl-Aufsuchungs Aktiengesellschaft, Schwarzenbergplatz 16, 1015 Wien, Austria; wilma.troiss@rag-austria.at

In cooperation with Rohöl-Aufsuchungs Aktiengesellschaft (RAG) a new log-based method is developed to identify precisely the depth of the top of the crystalline basement (Top-XX) within the Austrian Molasse basin.
Currently, different geophysical logs are used within the company with different emphasis. This results in varying depth estimates for Top-XX. Among the logs available (gamma ray, spontaneous potential, photoelectric effect, caliper, sonic, porosity, resistivity, density and formation micro imaging logs), resistivity logs are predominantely used to define the boundary.
Within the frame of this diploma thesis, six representative wells have been analyzed, whereof two wells provide each a crystalline basement overlain by sandstone horizons of Eocene (HIER-002A, MLRT-003C), Cenomanian (BH-N-001, BH-N-002) or Jurassic age (KH-003, V-037).
Based on detailed core inspections, Top-XX as well as the lithology above and below that boundary have been determined. Additionally, thin sections of representative core samples have been interpreted for petrographical composition. To determine log depths of the top of the crystalline basement, (total and spectral) core gamma ray (Core-GR) measurements were performed.
The result of this study indicates, that the well logging signal is influenced by several factors. These are, among others, the lithology, as well as heavy mineral contents at the base of the overlying sedimentary succession, but also the lithology and the degree of weathering of the crystalline basement (magmatic versus metamorphic). Therefore, a general log pattern across the Top-XX in the investigated wells cannot be observed.
However, close inspections show that all wells including Mesozoic sandstones overlying plutonic rocks exhibit high values of total GR at the base of the sandstones and significantly lower values of total GR within the uppermost part of the crystalline basement. Spectral Core-GR measurements indicate that high GR values are caused by heavy minerals (high contents of Th, U), whereas low GR contents result from weathering of the crystalline basement (removal of K). The content of potassium increases downwards, which suggests unweathered crystalline rocks including potassium feldspars.
In contrast to Mesozoic sandstones, Eocene sandstones provide a positive correlation of total GR values and the content of potassium. In this case, heavy minerals are not dominating GR values. According to the lithology of the crystalline basement, GR values are either increasing (metamorphic basement) or do not show significant changes (plutonitic rocks). Further investigations of different wells are necessary to determine if this is a general trend.
In summary, significant changes at the top of the crystalline basement are primarily visible in the GR log.