



## **New insights into the evolution of central Tyrrhenian margin of Italy (northern Latium off-shore area): evidences and constraints from seismic data interpretation**

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A revision of the available seismic reflection survey in the off-shore part of the northern Latium (central Italy) has been accomplished to better understand the deep structural setting of this area. Previous works performed in the last twenty years have compared the on-shore outcrops of cretaceous flyschoid and Plio-Pleistocene marine sedimentary units with shallow off-shore seismic reflection data (1/1,5 msec twt maximum), while the deep structural setting of calcareous basement of Tuscan units have been poorly analysed. The stratigraphy of the area is well constrained by a deep well, which goes through the entire sedimentary succession. Other geological constraints are provided by a discrete amount of deep wells in the on-shore part of the study area and by a voluminous bibliography, in which many authors tried to correlate this units to the tectonic units described in the central and northern part of the Apennines. The stratigraphy could be divided in four main groups of units; from top to bottom: Plio-Pleistocene marine deposits, Cretaceous Liguride deep-water units, Jurassic Tuscan pelagic deposits, and a Triassic evaporitic formation. Even volcanic intrusive bodies (Tolfa-Ceriti-Manziana dome complexes) are present in the on-shore part. The emplacement of this bodies generally caused a further overprint on the different deformation phases that affected this area.

Seismic reflection data analysis show that this area was affected by at least three deformational phases. After the deposition of the Tuscan and Liguride sedimentary units, the area underwent: i) an initial compressional phase associated to the Alps-Northern Apennine chain build up, with formation of compressional features as regional thrusts, back-thrusts and fold structures. These structures are clearly visible in the deep Tuscan and Liguride units setting; ii) a successive extensional deformation phase related to the spreading of the Tyrrhenian Sea, starting in the late Miocene times. This caused the formation of several small and narrow graben and half-graben basins with NW-SE and NE-SW direction of elongation, filled with up to 600m of conglomeratic, sandy and clayish sediments and a regional unconformity surface on top of the deformed basement. The sedimentation continued with the transgressive deposition of the Plio-Pleistocene clayish units, separated by a Middle Pliocene unconformity; iii) a final stage of deformation, strictly localized around the Late Pliocene volcanic intrusions of the Tolfa and Ceriti dome complexes. This is associated with local uplift (up to 200m), normal faulting, and radial tilting of the sedimentary units strata of the Mio-Pliocene sedimentary units in the on-shore graben and half-graben filled basins, analogous to the geological setting of the basins recognised in the off-shore part of this area.

Gravimetric and Magnetic anomaly data also suggest the possible presence of an off-shore intrusion just in front of the coastline of Civitavecchia city. Seismic reflection data analysis show in the same place a local perturbation of the sedimentation regime of the Plio-Pleistocene units due to the local change of basin morphology.