EXPOSURE OF DEEP OCEANIC CRUST AND UPPER MANTLE IN THE ATLANTIC OCEAN. COMPARISON WITH THE ECORS PROFILE FROM THE MEDITERRANEAN SEA

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The CROP-ECORS deep seismic survey of the Western Mediterranean basin has provided a complete crustal transect between the Golf of Lions and the western Sardinia rifted margins. Preliminary results have revealed the presence of a deep domain showing an intense crustal thinning. The zone is characterized by the absence of lower crustal reflections beneath the sediments; only Moho reflections have been observed. The crustal thinning has possibly affected both the upper and lower crust. Nevertheless, the lower crustal levels could eventually be non reflective, or masked by artefacts. In the case of the Sardinian margin, which is characterized by a an area of thinned continental crust, no lower crustal or Moho reflectors and observed beneath the slope.

Mechanisms proposed in order to explain the presence of deep crustal and upper mantle rocks may or not involve tangential tectonic displacement of the crust. In the first case, tectonic stretching is dominant and could result in an 300% increasing of the crust surface. One of the hypotheses proposed to explain the tectonic streching implies low angle detachment faulting. In the second case, outcropping of deep levels of the crust and upper mantle is related to the underplate ascent of mantle material resulting in *in situ* "metamorphism".

In the apparently different domains of the Atlantic and the Indian Ocean, the elevated walls ("transverse ridges") of large fracture zones may, in some cases, represent a window into the lower oceanic crust and upper mantle and thus, provide the opportunity to study these levels *in situ*. A submersible study was carried out on the southern wall of the Vema Fracture Zone (Mid-Atlantic Ridge 11°N) with the French submersible nautile. It made possible direct observations and sampling of two almost complete sections of oceanic crust and upper mantle from the bottom of the transform valley at 5150 m below sea level to the crest of the transverse ridge at about 2100 m b.s.l.. The first unit, exposed for a vertical thickness of almost 1 km (below 4200 m) consists essentially of serpentinized peridotites of upper mantle origin. On top of this unit, a gabbroid unit was observed and sample between 4200 and 3700 m. Samples of indurated sediments luing on the gabbros have been dated and indicate a minimum age of 10 Ma, which corresponds to the theoretical age of the crust (calculated for the given distance of 190 km from the M.A.R. axis, with a half-spreading rate of 1.2 cm/yr).

This age implies that the exposure of the gabbros representing the lower crust occured at/or close to the Ridge-Transform Intersection.

Furthermore, deep levels of the oceanic crust and the upper mantle rocks are also rather commonly exposed on the Atlantic Ocean seafloor away from the transform fault scarps, suggesting that their emplacement may be e charecteristic feeture of slow-spreading oceans (Juteau et al., 1990).

Understanding the processes leading to exposure of the deepest crustal levels and the serpentinized mantle peridotites, that act in present-day slow-spreading ridges, gives rise to two different hypotheses which are quite compareble to those stated in the case of the Western Mediterennean Sea. The mechanisms involved in the first hypothesis emphasize large variations in magma supply and dominatly tectonic phases of spreading accommodated by the streching of the crust along low angle normal and listric faulting (Karson et al., 1987). The second possibility implies a vertical rise of a metamorphic front which provokes physicochemical processes resulting in the outcropping of the deep levels of the crust and the upper mantle.

PRELIMINARY STUDY OF ALTERED VOLCANICS OF SAPPES - SYKORRACHI AREA, W. THRACE, FOR INDUSTRIAL MINERALS

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The Sappes area is located at the border of Essimi - Kirki and Sappes - Komotini Tertiary basins. The studied area is covered by volcanic rocks (tuffs and lavas) of indermidiate composition. Subvolcanic intrusive rocks (andesites) and plutonic rocks (quartz-Monzodiorite) are also occur in the area. The above formations are strongly altered as a result of tectonic - hydrothermal activity. On the basis of mineral assemblages the following alteration zones were identified: 1) Siliceous zones (quartz ± Fe - Mn - oxides, alunite, Au), 2) Alunite zone (alunite + quartz ±/or opal C-T ± Fe-Mn oxides ± FeS_2), 3) Sericite/argillic zone (sericite + kaolinite + quartz + FeS_2 ± I-S mixed layer, diaspore, rutile, smectite, albite, jarosite), 4) Keolinite zone (kaolinite + quartz ±/or opal C-T ± alunite, FeS_2. On the basis of mineralogical and chemical data, a first approach of these zones from the point of view of Industrial minerals is attemted.