Deformed units of continental basement in a collisional setting: the Sardinian-African Strait in Central Mediterranean

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Geological evolution and tectonic setting

The main geological features of the Sardinian-African Strait are shown in figure 1 (TRICART *et al.*, 1991). A 350 km wide submarine collisional chain, involving several tectono/stratigraphic units of the European and African plates, extends from Sardinia island to the Pelagian sea foreland.

Tectonically this collisional belt is composed (from top to bottom) of continental crystalline nappes and cover thrustsheets, mainly emplaced with S and SE vergences in latest Oligocene to Pliocene times (CATALANO *et al.*, 1989; COMPAGNONI *et al.*, 1989; BEN AVRAHAM *et al.*, 1991).

The main regional tectonic features are two low-angle SE-verging overthrusts. The outermost one, Burdigalian-Langhian (?) in age, represents the overthrust of the Kabylo-Calabrian crystalline nappes (CPK zone of Fig. 1) over the carbonate and clastic foredeep sequences of the African margin. The inner overthrust, perhaps Early Miocene in age, marks the tectonic contact between the Kabylo-Calabrian units and the superimposed Sardinian ones. The overall tectonic style, driven by the drifting and counterclockwise rotation of the Corsica-Sardinia microplate, records a large-scale intracontinental collision with development of a wide crustal shear zone, accompanied by a low-grade metamorphic re-equilibration in the Kabylo-Calabrian Hercynian assemblages. After this event tensional and strike-slip tectonics developed in the region during most of the Neogene.

Since late Pliocene the area is involved in compressional and transpressional deformations producing basin inversion and small-scale thrust faults along the contact between the Corsica-Sardinia block and the Kabylo-Calabrian units (TRICART *et al.*, 1990, 1991; TORELLI *et al.*, 1992).

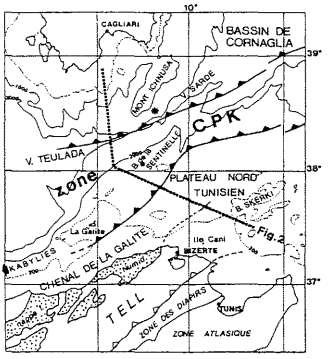

Fig.1

The proposed drilling and its main goals

We propose to drill one deep Hole (> 1 km bsf) in the Sardinian-African Strait (Fig. 2), in order to penetrate through the thrust surface separating the upper crystalline units of Sardinian type from the lower units of Kabylo-Calabrian type. Although this feature developed mostly in Early Neogene times, there are indications that tectonic activity, both with compressional and strike-slip character, is still active in the Sardinian-African Strait.

The purpose of the Hole would be to determinate the rheological nature (brittle vs. ductile), the fluid characters and the physico-chemical rock parameters associated with the thrust surface, which is clearly shown on figure 2 as a strong reflector inside acoustic basement intervals.

This data set should elucidate the mechanics of thrusting of continental basement units, at least at shallow crustal levels, and the interpretation of similar reflectors detected on deep seismic profiles shot in continental crust.

Additional goals of the proposed Site would be a better resolution of regional geology of the Central Mediterranean and of the stratigraphic and structural data obtained during Leg 107 for the nearby Tyrrhenian basin.

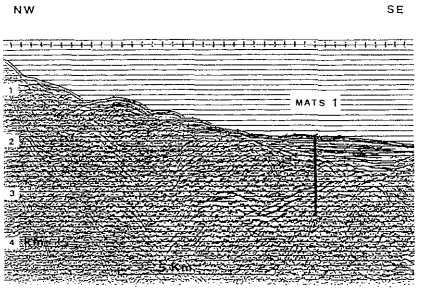

Fig. 2

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