# First Results of the "SARECO" Cruise on the Rhone Fan : Further Evidences of Destabilization Processes

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Most fan constructions were set up as sequential units which reflect the cyclic variations in relative sea-level . The main depositional features can be related either to constructional processes (overbank deposits) or to destructive ones such as gravitational failures . High quality acoustical data are needed to recognize internal characteristics, patterns and unconformities and to identify the relationship between deposits in order to correlate high frequency sea-level changes with the resulting stratigraphic sequences.

The poster presented illustrates the main depositional features which are well developed at the top of the upper constructional series of the Rhone fan (northwestern Mediterranean Sea, France). It is the first contribution of a research programme which began in November 1989 (SARECO cruise) using a deep-towed sonar and 3.5 kHz profiler ("SAR", Système Acoustique Remorqué) .

The construction of the Rhone fan began at the end of the Messinian crisis which was followed by the flooding of the Mediterranean Basin during the Plio-Quaternary period . The fan was fed with terrigenous material discharged by the Rhone River and transported through the Petit Rhone Canyon . Its structure results from the stacking-up of sedimentary bodies superposed during four main successive phases ("basal", "lower", "upper" and "surficial" series (DROZ and BELLAICHE, 1985). The surficial series is well displayed only to the west. Therefore the "upper" one can be observed elsewhere . It shows at its top, on both sides of the fan, two large sedimentary bodies which contain chaotic or transparent seismic facies interpreted as debris-flow deposits. The eastward transparent unit has been mapped over 5100 km² . It reaches 160 m in thickness and represents about 170 km³ (BELLAICHE, COUTELLIER, DROZ et LE CANN, 1990). It originated from the remobilization of previously stratified deposits . The 3.5 kHz lines and sonograms have shown scarps with truncated strata at the location where the movement was initiated . Sliding of sediments deposited on both the continental slope and deep-sea channel levees are documented .

Geotechnical properties of sediments (water content, plasticity and cohesion) were determined at the eastern limit of the western transparent unit (BOUYE, 1983; MEAR, 1984). A poorly cohesive grey silty mud body (CU < 40-50) was found to lay unconformably on cohesive silty mud (CU ranging from 40 to 80) . It thickens away from the limit of the unit and is overlain with thin Holocene recent grey mud, separated by an oxidized layer dated of 11.000 yrs B.P.. These variations of the geotechnical properties of the grey silty mud can be assumed to illustrate the abnormal superposition of the destabilized unit over the levee overbank stratified autochtonous deposits .

The uppermost construction of the deep-sea fan is due to a large extent to gravity induced mass transport which affected poorly compacted water-rich sediments on steep slopes and channel levees . These processes are assumed to have occurred mainly during the interglacial period and especially sea-level initial lowering (COLEMAN and ROBERTS, 1988) . Efficient new tools are still needed to study and correlate the major processes operative in deep-sea environments during the high frequency cycles of sea-level of the Quaternary . The SAR survey has provided such detailed information .

This programme will be developed and complemented by coring and in situ geotechnical measurements both in stratified and remobilized sedimentary units in the Rhone fan.

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