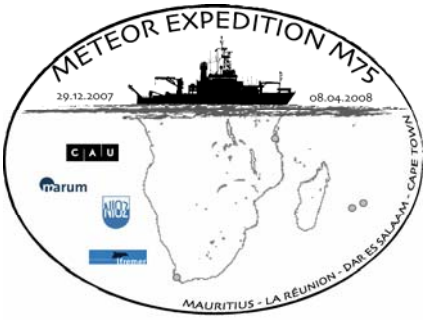
Expedition Meteor M75/1 – ERODER 2



2. Wochenbericht: 30.12.2007 – 6.01.2008

The M75/1 is **also named** ERODER 2, as it is part of a more complete geological program named ERODER: a high resolution study focused on the submarine slopes of La Réunion Island (Indian Ocean).

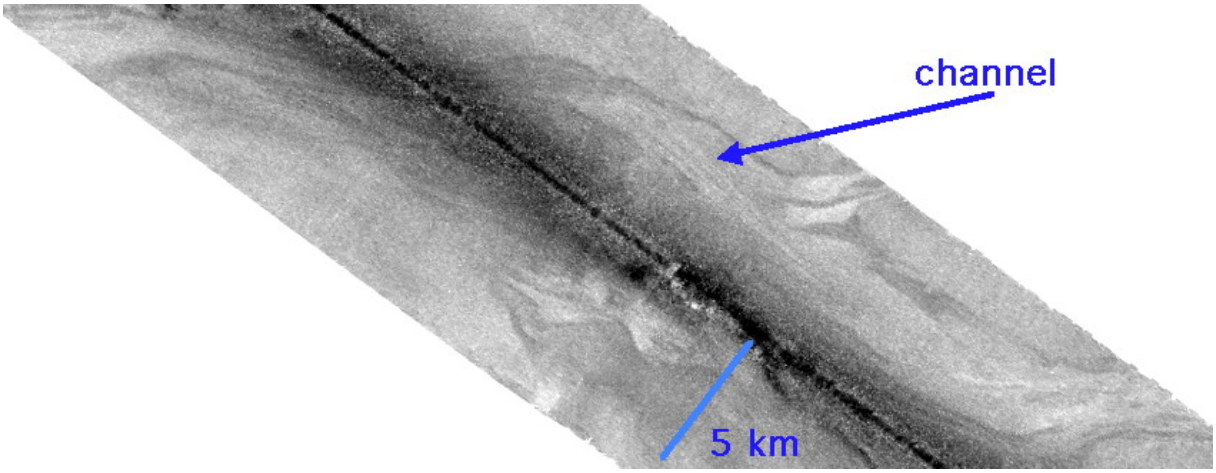
Two cruises: FOREVER and ERODER 1, performed in 2006, led to the discovery of volcanodetritic deep sea fans and new volcanic structures around La Réunion Island.

The main goal of the ERODER 2 cruise is to collect more detailed bathymetric, backscatter, mud-penetrator data and cores on these fans and seamounts to understand their origin and evolution and to study their present activity.

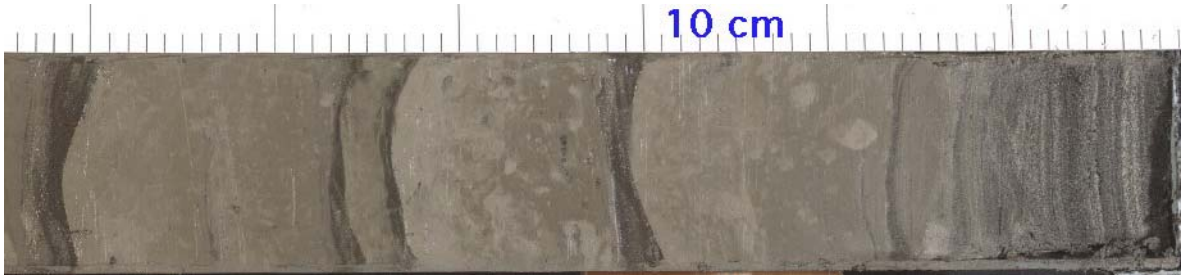
Last Sunday, the cruise was just starting, the weather was sunny and the sea quite calm. Unfortunately, the past week was more rainy and windy. The sea became rough (swell up to 3.5 m). However, we worked every day, even if some acoustic data are relatively noisy. Since the beginning of the cruise, we acquired a large amount of geophysical data (1583 kms of profile) at 7.5 knots, we did 7 coring and 5 dredging stations (6 collected cores and 2 successful dredges).

A group of seamounts rising above the oceanic plate was identified during the FOREVER campaign in April 2006, located off the west coast of La Réunion, near the Mahanoro trench. The geometry of these seamounts suggests that they were volcanic constructions. The easternmost of the group was the target for two dredges. It shows a relatively complex morphology with an oval general shape with ridges respectively orientated to the SW and to the E. Its summit was mapped during the week with a minimum depth of 1800 m. Dredges were respectively realized at the depth of 3111 m and 2750 m on its western flank. The first dredge sampled a small piece of basalt and a bigger composite block (40 x 30 x 20 cm) of made of a felsic rock (quartz + feldspar + a non-identified brown mineral) coated with sediments and with a Fe–Mn crust. This mineralogical composition suggests a continental origin of this rock. We hope to get more samples on these seamounts before the end of the cruise.

Recent studies carried out off north western Africa showed that the presence of volcanic islands along the Morocco and Mauritanian passive continental margins increased the complexity of deep-sea sedimentary facies distribution. The growth and the dismantling of these volcanoes modified the pre-existing seafloor topography and produced numerous submarine avalanches. However in spite of the numerous studies led around volcanic archipelagos like Canary and Hawaii. No true volcanodetritic deep sea fan similar to the ones observed in continental context has been observed in these areas. Most of the last week nights were devoted to the high resolution mapping of the Cilaos deep-sea fan discovered in 2006. All the data have been processed on board. The first backcatter images are very impressive (see below). They indicate that the fan is still very active and that submarine avalanches are able to transport sand down to 4400 m water depth at a distance of more than 300 kms from La Reunion island coasts.



We are still tracking the distal end of the submarine channels belonging to the Cilaos fan.



Several cores were collected within channels or on outerbanks. All cores have been opened and described on board by sedimentologists (see above). They show a series of “turbidite” beds, some of them containing medium to coarse sands. We collected massive sand beds which are a few tens of centimeters thick.

We are going to continue our exploration of the distal Cilaos fan over the next few days as well as coring and dredging operations.