Presentation Time: 2:15 PM-2:30 PM

CAPTURE OF A DEEP CONTOUR CURRENT BY A CANYON IN THE GULF OF CADIZ

MULDER, Thierry, *MARCHES, Elodie, CREMER, Michel, GONTHIER, Eliane, LECROART, Pascal, and HANQUIEZ, Vincent, UMR CNRS 5805 EPOC, University Bordeaux 1, Avenue des facultés, Talence cedex, 33405, France, t.mulder@epoc.u-bordeaux1.fr*

The Gulf of Cadiz represents the pathway of a strong, warm (13°C) and saline (> 37 g l-1) current called the Mediterranean Outflow Water (MOW) which comes out of the Mediterranean and spreads in the mid-depth North Atlantic at water depths of 800-1400 m. Its velocity is > 3 m/s when it flows out of the Strait of Gibraltar and drops quickly westward, but still reaches 0.2 m/s at Cape St. Vincent (southwest Portugal). From east to west, the sediments under the action of the geostrophic MOW branch records the impact of the decreasing energy of this current. On the north margin of the Gulf, the intensity of the MOW is low and fine-grained contourite drifts are built with an alongslope extension. The presence of a deep downslope canyon (Portimao Canyon) generates an important change in the pattern of contourite deposition. At this location, the MOW flows westward. On the eastern side of the canyon the MOW has a moderate energy, building a thick and large detached drift (Faro-Albufeira- Drift) with a clear prograding trend towards both north and west, and a high sedimentation rate. It is separated from the margin by a moat channel (Alvarez Cabral). On the western side of the Canyon, the MOW has a low energy. It only builds a flat and thin drift (Sagres-Portimao Drift) showing only slow aggradation and a low sedimentation rate. No moat channel is associated to the drift. Temperature-density measurements show that the MOW flows down the Portimao Canyon. The presence of the canyon is responsible from the sharp decrease of the flow energy between west and east canyon sides and the change in MOW competency and capacity. This case study represents an unusual example of the capture of a deep contour current by a canyon, i.e. a morphologic structure inherited both from structural control and gravity current activity.

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