Particle characterisation and flux at the Iberian Margin

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Introduction:
Our aim within OMEX is to determine and quantify the processes that mediate the flux of particles at the northern Iberian Margin and compare these to those at the Goban Spur using results from OMEX I. The Iberian Margin, with seasonally strong upwelling and a shallow shelf, steep slope and filament formation differs both in production characteristics and physical setting from the Goban Spur, and we hypothesise that this will be reflected in quantitative and qualitative export of particles from the margin.

Methods:
Time-series measurements of particle flux are being determined along a transect at 42° 38'N where two moorings are deployed instrumented with sediment traps, current meters and in situ pumps, as detailed in Table 1.

Table 1. Configurations of the sediment trap moorings at the Iberian Margin.

Mooring	Water depth	Position	Instrument depth	Instrument
IM2	1500 m	42°38.5'N, 9°42.3'W	580 m	Sediment trap
			600 m	Current meter
			650 m	In situ pump
			1050 m	Sediment trap
			1070 m	Current meter
			1120 m	In situ pump
IM3	2230 m	42°37.5'N, 10°01.5'W	570 m	Sediment trap
			590 m	Current meter
			645 m	In situ pump
			1050 m	Sediment trap
			1070 m	Current meter
			1750 m	Sediment trap
			1770 m	Current meter

The moorings were deployed from the Pelagia in August 1997 with sediment traps and current meters only. They were successfully recovered during the POSEIDON cruise in March 1998. With the exception of the sediment trap in 1753 m on IM3 that malfunctioned due to corrosion and flooding of the motor, a full set of samples and complete record of current meter data were obtained. In situ pumps, that were tested extensively and successfully on the ships wire were also deployed on the moorings in March 1998. Mooring recovery will be in January 1999

Extensive water column sampling was conducted during the POSEIDON cruise to determine across- and along-slope gradients in particle concentration and composition along the main OMEX transects that were defined during the WP2 meeting in Paris. A transmissiometer attached to the CTD gave vertical profiles of particle concentration and about 250 water samples were taken which will be analysed for dry weight, carbonate, opal, POC, PON and d15N isotopic composition. Samples are currently being analysed.

Results:

Work is on schedule with sediment trap samples being processed in the laboratory. A first view of the samples and microscopic examination during picking shows strong fluctuations in flux between sampling intervals. Analyses of SST images by the NERC Remote Sensing team (now available on the OMEX Web site) give a good spatial resolution of upwelling occurrence and filament formation for the Vigo region. Upwelling occurred shortly after trap deployment and a filament (albeit weak) developed over the trap position between approx. July 20th and Aug. 3rd. There was relaxation of upwelling intensity between 10th and 24th Aug. and stronger upwelling thereafter until about Sept. 14th. The sampling intervals of the traps (7 - 10 days) should allow resolution of these surface processes in trap material.

Preliminary analyses of current meter data show general agreement with historical data from this region with a predominantly poleward current on the mid and outer slope. Mean current speeds are somewhat lower than at the Goban Spur and show a decrease with increasing water depth. These data will be used to calculate the expected „catchment area“ of the upper traps, within which, in collaboration with the NERC Remote Sensing team, SST data will be integrated to enable comparison of the two data sets.

Strong spatial gradients in the concentration of suspended particulate matter (SPM) were found during Feb./March 1998 at the IM as seen from attenuation profiles from a transmissiometer attached to the CTD. The strongest and most persistent nepheloid layer was seen at 200 m depth, extending from close to the shelf to the 2500 m bathymetric contour. Water samples were taken from the CTD in the surface mixed layer, mid-water minimum and nepheloid layers. These are currently being processed and results will contribute to seasonal resolution of SPM. Long-term recordings of SPM quality are expected from analyses of material from the in situ pumps that will be recovered in Jan 1999.