Geophysical Research Abstracts, Vol. 7, 06341, 2005
SRef-ID: 1607-7962/gra/EGU05-A-06341

In-situ size distribution of Marine Particulate Matter: a method to determine transportation pathways and alteration of Particles in the Ocean

N. Nowald, V. Ratmeyer, **G. Fischer**, R. Davenport and G. Wefer

Geosciences Department and Research Center Ocean Margins (RCOM, University of Bremen), Leobener Strasse, 28359 Bremen, F.R.G. (nnowald@marum.de / ++49 421 218 65612)

One of the world´s largest upwelling systems is located along the northwest African coast. Due to the high fertility of upwelling systems, the quantity of organic material exported from the ocean surface to the seafloor is supposed to be 10 to 100 times higher compared to other ecosystems (Barber and Smith, 1981). Hence, the region off northwest Africa was subject of many palaeoclimatic and particle flux studies. Although significant progress for our understanding of this highly dynamic upwelling system was made, little is known about the in-situ distribution of particulate matter in this region. Still not sufficiently understood are the transportation pathways and the alteration of particulate matter in the water column. Our knowledge about shape, size and vertical distribution of particles in the ocean is mainly based on non-destructive, optical methods, like camera systems (e.g. Asper et al., 1992; Honjo et al., 1984; Stemmann et al., 2002). With aid of the vertically profiling, deep-sea camera system ParCa (Ratmeyer and Wefer, 1996), more than 40 camera profiles were obtained off the northwest African coast. The profiles were acquired within three campaigns in 2001, 2002 and 2003 during spring time in waterdepths ranging between 200 m on the shelf down to 4000 m in the abyssal plains. Important transport processes could be determined on the basis of the vertical abundance and size distribution profiles. Alterations and anomalies seen in the particle sizes reflect fast sinking events as well as huge lateral intrusions of marine particulate matter.

References

Asper, V.L., Honjo, S., and Orsi, T.H., 1992, Distribution and transport of marine snow

aggregates in the Panama Basin: Deep Sea Research I, v. 39, p. 939-952.

Barber, R.T., and Smith, R.L., 1981, Coastal upwelling systems, *in* Analysis of Marine Ecosystems, edited by A.R. Longhurst, San Diego, Academic, p. 31-68.

Honjo, S., Doherty, K.W., Agrawal, Y.C., and Asper, V.L., 1984, Direct optical assessment of large amorphous aggregates (marine snow) in the deep ocean: deep Sea Research i, v. 31, p. 67-76.

Ratmeyer, V., and Wefer, G., 1996, A high resolution camera system (ParCa) for imaging particles in the ocean: System design and results from profiles and a three-month deployment: Journal of Marine Research, v. 54, p. 589-603.

Stemmann, L., Gorsky, G., Marty, J.-C., Picheral, M., and Miquel, J.-C., 2002, Four-year study of large-particle vertical distribution (0-1000m) in the NW Mediterranean in relation to hydrology, phytoplankton, and vertical flux: Deep Sea Research II, v. 49, p. 2143-2162.