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Interactive comment on “Distribution and transport processes of marine particulate matter off Cape Blanc (NW-Africa): results from vertical camera profiles” by N. Nowald et al.

Anonymous Referee #2

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The manuscript describes the results of three measurement campaigns off Cape Blanc during which vertical profiles of particle abundance have been acquired using a deep-sea camera system. While such data are interesting and might be useful to other teams, their interpretation in this manuscript is rather weak.

Instantaneous particle size distribution and abundance profiles do not tell much if they cannot be placed within the context of reasonably coincident hydrodynamic/physical flow properties (no coincident CTD data, sediment trap, flow data). Considering the large natural variability of the underlying processes, the data set is also extremely limited and cannot be considered as representative of particular events nor of the spatial

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or interannual variability. Therefore, these data cannot support any scientifically sound analysis in terms of transport processes of particulate matter, as claimed in the title and core of the manuscript. At this stage, all the conclusions about the composition of the particulate matter and its dynamics are pure speculation and need to be better substantiated.

The comparison of the measurements with model results in the so-called “companion paper” is interesting but is far too superficial here. One can wonder why the data reported here have not been discussed in this companion paper (published elsewhere). The analysis carried out in the current paper is insufficient.

Specific comments :

The relation between the biomass concentration and the particle abundance (section 4.1) should be quantified. Instead of figure 8 - from which a clear connection is difficult to identify – , a correlation plot should be provided.

The differences between the 3 transects should not be attributed to the interannual variability (section 5.1) since high frequency variations can also be responsible for similar variations.

At page 916 - line 22 - a “decreasing trend in the particle concentrations with increasing distance from the coast” is identified from only two values ! This is not serious.

Not only the biomass is important to explain the abundance of particles, the dynamics of the ecosystem - fluxes, production rate and way of functioning of the ecosystem - are also important. The biological signature of the surface particles is still highly speculative and need to be proved (section 5.1).

The sub-surface maximum is very small at some stations...

The explanations about the origin of the sub-surface maximum and that at the seafloor are highly speculative. Sentences like “Our results show that particles produced along the shelf areas are advected several hundred kilometres offshore in a subsurface max-

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imum layer system” are not supported at all.

External assessments of the sedimentation velocity associated with the apparent “sinking event” discussed in section 5.2 are lacking. Without such data, it is not appropriate to speak about a “rapid sinking particle cloud”.

The authors should be more careful when using the word “depleted” to characterize the reduction of the relative importance of small particles at some depths. The size distribution is a relative measure. Therefore, if the frequency of the small particles decreases (as in figure 7), this does not mean at all that small particles are depleted. Their absolute number might even be higher than at surrounding locations. Only their relative frequency is smaller, possibly because of an input of larger particles. The term “depleted” is therefore misleading.

Interactive comment on Ocean Sci. Discuss., 3, 903, 2006.

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