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Interactive comment on “Role of environmental factors for the vertical distribution (0–1000 m) of marine bacterial communities in the NW Mediterranean Sea” by J. F. Ghiglione et al.

Anonymous Referee #2

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This study presents data on the vertical distribution of bacterial communities at the DY-FAMED site (NW Mediterranean). The authors use an extensive statistical approach in an attempt to elucidate the mechanisms that control the distribution of bacterial communities in marine systems. The paper is in general well written and the presented data should be of interest to the readers of Biogeosciences.

The main criticism I have is the lack of interpretation of the data and of the statistical analysis. The authors claim in the abstract (Lines 24-26) that their study "is probably the first example of an analysis employing a complex environmental data set in combination with microbial community profiles to unravel the mechanisms underneath

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bacterial assemblages in marine systems". I suggest the authors to make a bigger effort to interpret their results in order to shed some light on the mechanisms forcing the observed vertical distribution on the bacterial communities.

My second criticism is tightly related to the first one. The results are presented in a "too statistical" language. If the authors prefer to maintain that language they should then make an effort in the discussion to use a more ecological or biogeochemical language in order to extend the interest of the paper to a wider community. The statistical analysis should not be the last step of the study but a tool to evaluate hypotheses and to better understand the observed patterns.

Specific comments:

Page 2136, Lines 16-18. Please, indicate the detection limits of the used methods. This is particularly necessary for phosphate since the Mediterranean Sea is severely P-depleted during the stratification season (phosphate concentrations down to 2 nmol L⁻¹). What was P concentration in the study? Was it detectable by the Technicon method?

Pages 2143-2144 (Section 3.2.). It would be interesting to give mean values and/or ranges of the physicochemical variables.

Page 2149, Lines 5-7. I suggest the authors to discuss two recent articles by Jed Fuhrman et al. in 2006 and 2008 at PNAS. Other articles, already suggested by Dr. Stingl, should be used to build the discussion.

Page 2149, Lines 7-9. In my opinion, the statistical analysis performed does not demonstrate on its own that all the variables are acting in synergy. It can be the basis to evaluate hypotheses about the cause of the observed vertical gradient.

Page 2150, Lines 15-17. Protozoa and viruses may be the major controllers of bacterial growth and diversity. These factors need to be discussed properly.

References:

Fuhrman et al. 2006. Annually reoccurring bacterial communities are predictable from ocean conditions. Proceedings of the National Academy of Sciences of the USA. 103 (35): 13104-13109. Fuhrman et al. 2008. A latitudinal diversity gradient in planktonic marine bacteria. Proceedings of the National Academy of Sciences of the USA. 105 (22): 7774-7778.

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