

Interactive comment on “Coupling physics and biogeochemistry thanks to high resolution observations of the phytoplankton community structure in the North-Western Mediterranean Sea” by Pierre Marrec et al.

Anonymous Referee #1

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This manuscript provides a valuable contribution to the study of the relationships between the fine scale distribution of physico-chemical variables and of flow cytometry-derived phytoplankton groups in open waters of the NW Mediterranean. The methodology is up to date and the measurements appear to have been carefully carried out. The conclusions are plausible, but it should be noted that there is more taxonomic richness in “phytoplankton community structure” than that measured in flow cytometric groups; it can be argued that some samples for microscopic examination (to name a classical technique) would have added interesting information to the work. The follow-

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ing comments refer mainly to the “communication” aspect of the text, which is rather prolix and difficult to follow in several places. Methods Some parts of section 2.7 would benefit from more detailed and clearer explanations (e. g., lines 31 of page 8 to 3 of page 9). Some of the mathematical symbols used may not be obvious for a number of readers (e. g., eq. 5, eq. 9). Results Several parts of section 3.2 (Phytoplankton group definition) could be transferred to the Material and methods. (in particular, lines 1-20 of page 11). Lines 1-8 of page 13. There should be a previous explanation of what are warm boundary type 1 and type 2 waters (now in lines 34-39 of page 15). Section 3-5. Perhaps some of the details could be moved to material and Methods, so that the main findings would be easier to follow. Discussion Section 4.3. Part of the text is repetitive of methods or results and distracts from the main aim of the discussion. Please, try to streamline all the subsections. Other comments Page 1, line 29. “nano-eukaryotes”. Page 2, line 5. “rise²”. Page 5, line 9. The convenience of the phaeopigment “correction” is doubtful (e. g., Stich and Brinker 1995, Arch. Hydrobiol. 162 1 111–120). Line 39. SSS data every minute? Or what?? Page 6, lines 4-5. Rewrite the sentence. As it stands, it seems to say that 177 samples were collected every 20 minutes & e. g. “surface samples were collected every 20 minutes; in total, 177 were obtained” or similar). Line 14-15. “phytoplankton size wide range”??? or “a wide range of phytoplankton sizes”?. Line 36. Explain the meaning of “a.u.” (arbitrary units?). Page 8, line 23. “cell removal processes”. Page 10, lines 21-23. How exactly were these correlations carried out? Page 14, lines 8- 10. “although the sampling frequency spanned 20 min” ??? Explain better. Line 25. “derive growth rate”. Page 15, line 24. “low salinity subsurface water”. Lines 34-38. As mentioned before, this explanation should appear earlier. Page 16, line 8. “either limited”? Improve the sentence. Line 24. “resolve”. Page 17, line 5. “ecotypes in surface waters”. Line 17. “that the pico-eukaryote”. Page 17. Lines 17-21. Please, revise sentence carefully; concerning radiolarians and dinoflagellates, Not et al. (2009) state (page 4) that : “As the smallest eukaryotic organism known so far has a cell diameter of 0.8 μm [27], some of the 18S rDNA signatures observed in the 0.8 μm fraction might indeed derive from very small

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eukaryotes (like the prasinophytes that appeared mostly in this small fraction, Table S4), but many sequences most likely derive from cell debris or extracellular DNA from larger cells. This is likely the case for radiolarians, dinoflagellates, and ciliates, groups known to contain relatively large nano- and microplanktonic cells, and for which sequences were prominent in the 0.8 mm fraction and nearly absent from the 0.8–3 m m fraction.” (Thus, these groups were not part of the picoplankton). Not et al. (2009) also mention the importance of prasinophytes in the picoeukaryote fraction.

Page 17. Line 25: “cryptophycean taxa”. Line 29: “Gephyrocapsa”. Line 30: “Prymnesiophyceae”. Page 18, line 5. Specify what is dominated by diatoms and dinoflagellates. Line 11 (and other parts of the text): “Marañón et al., 2003” as cited in the reference list (not “Maranon”). Line 19. “where nitrate was not limiting”. Line 36. Italics for generic names.

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