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Comment

# ***Interactive comment on “Primary marine aerosol emissions from the Mediterranean Sea during pre-bloom and oligotrophic conditions: correlations to seawater chlorophyll $a$ from a mesocosm study” by A. N. Schwier et al.***

**F. Dulac**

francois.dulac@cea.fr

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This manuscript describes interesting results on primary marine emissions including their organic fraction and includes a review of many previous studies. I have a few comments as detailed hereafter:

- My most important concern is about particle size distribution fitting and related results discussion. Even if those numbers are stated as approximate by using the sign “ $\sim$ ”, I cannot find realistic to report with 3 significant digits either mode fractions (e.g.  $\sim$

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0.295, 0.482) or mode diameters ( $\sim 18.5, 37.5, 91.5$  and  $260$  nm). Table 2 suggests for instance that it would probably be more appropriate to give ranges for every mode. In addition, we miss information on the variability on the geometric standard deviations of the fitted modes when they are needed to fully characterize the size distribution. I believe that we miss in the methodological section 2 a sub-section describing the particle size distribution fitting technique and discussing accuracy of results which are the basis of the paper. This is important that the limits of this fitting have been assessed when discussing differences between experiments. I would also expect to see discussed how robust is the choice of 4 modes for fitting, and how variable are the size distribution results. For instance we miss associated standard deviations in Table 2 and I find that Figure 1 should be completed with another plot that shows the variability (e.g. by plotting all curves obtained on a single plot, or showing envelopes...).

- In section 2.2, I find that we miss information of DMA size channels and measurement integration time for size distributions. How variable is the size distribution measured for a set of given conditions?

- I am questioning the negative values of kappa occasionally found. Cannot you tentatively use them to better constrain Kappa-inorg? If you really end up with unrealistic values for Kappa-inorg, is it justified to keep those points in the data set for correlations rather than discarding them (figures 9-10)?

- When discussing correlations with biological parameters in section 3.4, I find that you might be more precise by giving significance levels of the correlations (that depend on the number of points used or degree of freedom). Is it really appropriate to state that you “find a correlation” when  $R$  is about 0.4 or a bit lower. In the case of the correlation between *Synecococcus* and DOC, is it really robust or rather driven by the single point with the highest DOC value: what if you fit without this peculiar point? The sigmoid fit used in Fig. 10f seems also more appropriate for most of the correlations (e.g. Fig. 10a, 10c, 10e): is it justified to stick to linear correlations?

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Other technical comments:

- You should generalize the use of the italic style for all symbols throughout the paper.
- Abstract: it would be worth indicating the particle size range of your measurements (10-400 nm) which constrains the size distribution fitting.
- Abstract, line 16: specify “kappa (k)”.
- p.26196, line 16: given that the mesocosm diameter is 2.3 m, I rather calculate that 5 L of water corresponds to 1.2 mm in height, not 15 cm.
- p.26197, l.11: I think “cm<sup>3</sup>” is expected instead of “cm”; I would rather write "of ~10 cm”.
- p.26202, l.6: specify “the water temperature”.
- p.26203, l.12: I’d rather use the singular in “no visible changes”.
- p.26206, l.12: specify that this correlation is “(not shown)”.
- p.26207, l.25: I’d rather use the singular in “any parameters”.
- p.26208, l.25-26: the second part of the sentence seems unclear to me as written; I think that the two word groups “Chl a and additional pigments” and “the organic fraction” must be switched in the first part of the sentence.
- Acknowledgements: the acronym MISTRALS is missing its terminal S; “MISTRALS/ChArMEx” would be more appropriate.
- Table 2: It is not clear in the legend that these numbers are averages.
- Many figures are difficult to read once printed, with too small characters.
- Fig. 1: Ordinate axis legend should probably state “Normalized number fraction”, since the curves appeared normalized by their maximum value.
- Legend of Table 2, Figures 3 and 6 (and possibly other occurrences): I would specify

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“CO<sub>2</sub>-enriched”.

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