

Interactive comment on “An Overview of the Surface Ocean Aerosol Production (SOAP) campaign” by Cliff S. Law et al.

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The SOAP experiment is one of the largest, most comprehensive and most interesting efforts conducted so far to study biogeochemical surface ocean – lower atmosphere interactions. Some articles on topical studies within the global study have been or are being published, but there is the critical need for an overview paper like this that provides the context and describes the experimental approach. The present manuscript is definitely worth publishing to serve this purpose, even though it falls a bit short in enunciating the main findings and advances of knowledge.

I particularly like the introduction, which does a very good job with summarizing the state of the art, the gaps of knowledge and the need for such an experiment. The

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oceanographic and environmental regional context is very much appreciated too. The other aspect I like best is the listing of the instruments and how they complement one another. This is something typically missing in many papers for a lack of space, and that the nature of this manuscript allows.

I do not have much to say. I miss comparison with previous similar cruises, such as the ACSOE or the SAGE, and statement of what is different and how SOAP goes a step forward.

In terms of a bloom-related study, SOAP is a bit disappointing. I mean, the links between each of the blooms, its biogeochemical processes, and the results of the air-sea exchange, are weak. Effort is made in the present manuscript to argument that each of the situations or blooms is not a static environment but dynamic, with changes associated with meteo forcing and so forth. This is sharp and honest – the drawback is that the blooms were not very clearly delineated so that process-based associations with aerosol precursors of more general applicability could be built. Do you the authors agree with this analysis? Along these same lines, the recent paper by Royer et al. (2016) in Scientific Reports shows dramatic changes in DMS concentration associated with the passage of a storm.

Specifics

-Line 207: Mahajan et al. 2006 should read 2015 -Line 314: remove parenthesis after 9 nmol L⁻¹ -Page 17: when discussing about the underestimation of the current climatology for the region, and call for a revision into much higher concentration, to what extent do you think your numbers are biased high because you deliberately visited blooms? What can you say about average regional concentrations? -Page 19: To me, it is pretty obvious that instantaneous correlations between chl_a and the aqueous concentration of DMS or any other biogenic volatile can be expected (yet not always found), but not necessarily with the flux. The flux depends primarily on the aqueous concentration but also on e.g. the wind speed. Therefore, correlations between biological markers and

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the emission flux are to be expected, if anything, over longer time scales.

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