

Editors comment paper acp-2017-9; Oxygenated volatile organic carbon in the western Pacific convective centre: ocean cycling, air-sea gas exchange and atmospheric transport by Schlundt et al.

Abstract: "The flux of atmospheric OVOCs was on average into the ocean for all gases, except butanal, with a few important exceptions near the coast of Borneo"

This added sentence was actually raising confusion since 1) the previous sentences are initially suggesting that the ocean is a source of OVOCs 2) are the few exceptions referring to butanal or to the fact that for all OVOCs there is generally deposition? I would anyhow also reformulate this sentence after having read in detail again the overall the document. It seems that those couple of sentences of the abstract were not clearly explaining the main findings. I propose just a change in the sequence of the sentences that might help in overcoming this:

"The measurement-inferred OVOCs fluxes away from the North Borneo coastal waters were generally reflecting uptake of OVOCs by the ocean for all gases, except of butanal. Over the Borneo coastal waters, the atmospheric OVOC mixing ratios were relatively high compared with literature values, suggesting that this coastal region of North Borneo is a local hotspot for atmospheric OVOCs including a significant coastal water source of atmospheric OVOC's."

Introduction:

Reading the following sentence;

"OVOCs, such as acetone and acetaldehyde, are involved in the production of reactive nitrogen compounds, such as nitrogen dioxide (NO₂, involved in ozone production), peroxyntic acid (HNO₄), and nitric acid (HNO₃)"

I started to wonder if you can really say that NO₂ is produced involving these OVOCs. The NO₂ is produced from the NO involving the RO₂ and which is affected by the OVOCs but the NO-NO₂-O₃ system is expressing a cycle. I would rephrase this to:

"OVOCs, such as acetone and acetaldehyde, are affecting the cycling of the reactive nitrogen compounds nitrogen oxide (NO) and nitrogen dioxide (NO₂), and associated ozone production, and involved in the production of peroxyntic acid (HNO₄), and nitric acid (HNO₃)"

Pp2: Carpenter *et al.* (2012) and references therein

Make this reference listing consistent with how other references are included.

Pp2; line 37: -48 to -1 Tg yr⁻¹; does a negative value here reflect a source or sink for OVOCs to the atmosphere? I would add after the listed references ", with the negative values here reflecting the ocean being a sink for acetone"

Pp3, line 2 "...no ocean-atmosphere butanal or butanone fluxes.."

Pp3, line 8 "...trace gases ~~even~~ into the UT..."

Pp 6, line 19; add here something like "Note that according to Eqn 1, a negative flux reflects

a flux from the atmosphere to the ocean and vice versa.”

Pp 6, line 23: “...at 10 m height and on..”

and replace “Within the Johnson (2010) publication, there is a critical discussion of using Duce et al. (1991) to compute k_a ” with “Johnson (2010) provided a discussion of using Duce et al. (1991) to compute k_a ”

Pp 6, line 25: “The newly computed fluxes were ~~an~~ on average ~~of~~ 20% higher (lower in the case of negative fluxes). We treat this difference in the calculated fluxes as uncertainty and use the lower fluxes as a conservative estimate of OVOC fluxes into and out of the ocean surface.” This revised text further confuses the interpretation of the paper in terms what negative and positive values of fluxes reflect. So, if I get it right using the alternative approach to calculate k_a , inferred negative/deposition (atmosphere-to ocean) fluxes are reduced by about 20% whereas positive fluxes (emissions) are “on average 20% higher”?

Pp6; line 35 and beyond; since you are discussing the emissions of OVOCs into the MBL being studied with FLEXPART; you list all the processes that are considered in FLEXPART except of emissions! How are these treated in this model? As a negative dry deposition flux?

Pp 7, line 30: “compared to a study along the South-East Florida coast” (or alternatively “in the coastal waters of South-East Florida”

Pp 8; line 16 “compared with”; check the whole document actually on this; according to me it is here “compared to” (compared with is used when things are similar, e.g., of magnitude) whereas “compared to” is used when you contrast things.

Pp 10: line 28 “for the entire ocean mixed layer” (to contrast this with the atmospheric mixed/boundary layer)

Pp 11, line 30: suggesting to change to; “For all measurement locations with a positive flux, reflecting the ocean being a source for atmospheric OVOCs,” and would it be useful here to shortly indicate how many of all samples are indeed showing positive fluxes?

Pp 12: line 30: “...driven by the hotspots east of 116°E which occur in all three OVOCs..” this statement reads weird: I would suggest to say, “..due to presence of areas east of 116 °E with large sources reflected in the measurements of all three OVOCs”

Pp 13: line 9-10: “ hot spots exist at some short distance from the cruise track area. However, we think this is less likely as these hotspots”; hot spots or hotspots?
And would it not be better to refer instead of a hotspot to “ a strong source area”?

Pp 13, line 35: list the reference Blitz et al. in the proper way

Pp 13, line 41: I happen to know the EMAC modelling system but not other readers; revise by or explaining the acronym or simply referring to EMAC as a “global chemistry-climate modelling system”