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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Air–sea fluxes of oxygenated volatile organic compounds across the Atlantic Ocean" *by* M. Yang et al.

Anonymous Referee #2

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General Comments:

Yang et al. have used PTR-MS to perform eddy covariance (EC) measurements of three atmospherically important oxygenated volatile organic compounds (OVOCs), acetone, acetaldehyde, and methanol. These are among the first EC measurements of these compounds, especially with PTR-MS instrumentation. Certainly, this manuscript is an important contribution to the field and merits publication in ACP. There are some minor revisions needed before publication. Please see specific comments below.

Specific Comments:

Overall manuscript – what is your sign convention? Why do you include the contaminated funnel data instead of removing it and mentioning the contamination as the

reason for the removal?

Pg 8023, lines 1-8 – How sure are the authors that 500 m depth are appropriate for the precision discussion? It seems that the ocean cycling of these compounds is not exactly pinned down. Why not use replicate standard measurements to determine the precision? Perhaps it is not obvious why these measurements determine the limit of detection and the authors can more clearly explain their logic here.

Pg 8028, line 25 until Pg 8029 – It seems that the authors neglect the roll of the oceanic sinks. Perhaps there is greater consumption at 500 m and the depth profile is reflecting that instead of the production in the photic zone. Maybe previous authors are wrong about the extent of the photochemical source or perhaps the sinks mar the visibility of the signal. Not much is known about the full biogeochemical cycle of these compounds.

Pg 8030, lines 1 - 11 – The authors do not have an extensive comparison with previous work here. How does their calculation fit into atmospheric budget of acetone? Would the budget be balanced with their value(s)? How does it compare with known photochemistry in the atmosphere? What about the comparison with the Jacob budget or with Marandino et al (the values here are very different than their reported values)?

App B – The authors' hypothesis about acetaldehyde concentrations in the catalytic converter could be tested with standard additions – did they attempt this and if so what happened? If not, why not? I do not understand why air equilibrated with water was not then passed through the catalytic converter (instead of bypassing the equilibrator)?

Pg 8035, line 26 - typo controlled should be control

Figure 3 – why is the spectrum of potentially contaminated data used for this figure? Can't the authors compare with a better flux run?

Figure 6b – it would be easier to see the equilibrium values if there was a line indicating it

Figure 12 – latitude seems to have influence on the correlation, have the authors tried

to separate and look at the different relationships (could also be instructive for figure 11)? If certain latitudes have better correlation than others, it is possible that other concurrently measured data can shed some light on the reasons.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 8015, 2014.