Authors' response to the 'reviewer comments for OS-2018-108' by Anonymous Referee #3

We would like to express our gratitude to the Anonymous Referee #3 for their thorough and helpful review. Our answers are given in the table below.

Reviewer's comment	**Authors' response**
My only major comment is the heavy focus on comparing with the dual tracer technique. The ACFT approach has a completely different 'time constant' relating k to more or less instantaneous wind with a footprint of a few square meters, whereas the dual tracer technique is quite the opposite. I think a more proper comparison would be with eddy covariance based results.	We have added an eddy covariance based parametrization of CO2 to Fig. 6, as well as two eddy covariance based datasets of the transfer of DMS. We have extended the discussion of the results with respect to those CO2 and DMS measurements.
Page 2. Line 12: Waterside convection is also a process which might influence the transfer velocity	We added '[...] and convective mixing (e.g. \citet{rutgersson2011}).' to the end of the first paragraph of Section 2.
Page 2, paragraph starting at line 25, the recent paper by Pereira et al. 2018, would also be good to include here.	We replaced the citation Pereira et al. 2016 with the much more recent Pereira et al. 2018, since both use the same technique: gas exchange is measured in a baffle stirred tank with water sampled from the ocean.
Page 5, figure 1: how sensitive are your calculated transfer velocities to the variation Sc?	We assume the Schmidt numbers (or Prandtl numbers in the case of heat) to be well known, i.e. as having no uncertainty. The uncertainty of the Schmidt number exponent when Schmidt number scaling is done is included in the uncertainty of the calculated gas transfer velocity (error bars in figs. 3-6).
Page 6, lines 25-26: how long averaging period did you use?	The wind speed was averaged for duration of each single measured heat transfer velocity measurement, i.e. about 20 minutes. Weather data was provided by the ships with a temporal resolution of 1 minute (FS Alkor) and 10 seconds (RV Aranda).
Page 6, line 27, I think section 4.2 suits better before the current 4.1 section.	We agree. Sections 4.1 and 4.2 are swapped in the updated manuscript.
Page 8, figure 3: I would suggest comparing with an EC based parameterization in- stead. Additionally, Ho et al. use a 10-min mean wind speed, what averaging period are you using for your wind speeds?	Concerning the averaging period, see our response to comment no. 5. We have added an eddy covariance based parametrization for the transfer of CO2 to fig. 6, in addition to two eddy covariance based data sets of the tracer DMS.
Page 8-9, line 1: please specify what you mean by "the response time of the system is very high", what is meant by "high" here, how long time is this?	We have reworded and extended this section, to hopefully better describe the relationships between the response time of the water surface and the residence time of a water parcel in the heated patch.
Page 9, line 3: similar comment, please specify what the typical response time of the water surface you refer to	Response times can be easily calculated from the heat transfer velocities given in the appendix of the manuscript and Eqn. 4 in the manuscript. For wind speeds of 5m/s and above, they are in the order of 0.3-1.7 s.

Page 9, line 5: again, how long are the residence times estimated from the IR images.	The residence times measured for the conditions below 5m/s wind speed are around 1.6 to 3.3 s. Using Eqn. 4 we can see that we cannot resolve transfer velocities below $\mathrm{k} = \sqrt{\mathrm{D}_{\mathrm{heat}}/\tau_{\mathrm{res}}}$. Thus the minimum resolvable transfer velocity is in the order of k_{heat}=75 to 100cm/h. However, we do expect lower heat transfer velocities than that at low wind speeds. One can see that by Schmidt number scaling (for instance) the Ho parametrization to a Schmidt number (or Prandtl number) of 7.
Page 12, line 10: The Aelotron has already been introduced in the text, no need for a second introduction here.	Those sentences were not intended as another introduction of the Aeolotron, but a justification why we think it is the best wind-wave tank to compare our field data to. We reworded the sentence to better stress what we wanted to say there.