

Interactive comment on “First air–sea gas exchange laboratory study at hurricane wind speeds” by K. E. Krall et al.

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We thank anonymous referee 1 for the helpful comments.

Referee comment: Might consider title change to “First laboratory study of air-sea gas exchange at hurricane wind speeds ”

Response: The Title will be changed according to the suggestion.

Referee comment: "I'd suggest considering a few more comments on DMS. [...] Based on the chemical arguments put forward by Vlahos et al., which related specifically to DMS, if their theoretical arguments were applied to the gases used in this study what would be the predicted reduction in transfer rates at highest winds for the gases used in this study? Is this even possible to calculate? If it were possible, it would

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provide a more quantitative test of their theory (including an error assessment)."

Response: The hint to consider the transfer of dimethylsulfide (DMS) is very valuable. However, to check the theory presented by Vlahos et al. (2009 and 2011) for DMS as well as for the two volatile species used in our experiment, it would be necessary to know the total surface of bubbles submerged by breaking waves in relation to the surface area of the facility. These data are not available from our pilot experiment. All we can say at the moment is that difluorobenzene and hexafluorobenzene are flat symmetrical molecules with certainly a much lower surface activity than DMS. One study, Allesch et.al 2007 (DOI: 10.1021/jp065429c) found that benzene and hexafluorobenzene do not behave as ordinary hydrophobic solutes, but rather present two distinct regions, one equatorial and the other axial, that exhibit different solvation properties, which indicates the potential for a slight surface activity. This is probably also true for the similarly structured 1,4-difluorobenzene.

Interactive comment on Ocean Sci. Discuss., 10, 1971, 2013.