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Interactive comment on "An automated gas exchange tank for determining gas transfer velocities in natural seawater samples" *by* K. Schneider-Zapp et al.

Anonymous Referee #2

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The manuscript from Schneider et al. presents an updated version of a sealed tank designed for studying air-sea gas exchange. The previous version was semi-automated, and uncertainities not determined to a level required for gas exchange assessments. The aim of the manuscript is to provided a full automation to improve reproducibility and accuracy in the laboratory-based assessment of air-sea gas exchange. The authors conducted a number of experiments with DI water to prove reproducible results.

Section 3.1 I agree with the other reviewer that the simulation of turbulence via a baffle does not represent a natural mechanism, but it is absolutely sensible to use it for this kind of setup. I believe reproducing natural turbulence in a small tank is not possible at all, and the described tank with baffle is still useful to gain new insights in the

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fundamentals of air-sea gas exchange.

Section 4.1 A minor critism in the sampling of real samples is the use of a bucket to collect subsurface samples, as it would also collect material from the microlayer. But it does not affect the assessment of the tank setup.

Section 4.2 I could imagine that it is extremely difficult to reduce the surfactant activity in the tanks‘s microlazer to that of DI water as tiny amounts of DOM would change it. It would be good to show some data how close the authors came to the surfactant activity of DI water.

Filling the tank is described well, but I do not see where the microlayer samples, collected with screen during field sampling, come into the play.

Page 15, Line 25: I think it would be nice to provide (potentially young) readers a description how to do the calcultion of Gaussian error propagation.

Section 4.4 For me as a more practical scientist a little too long and hard to read. The manuscript describes well a labortory setup, and the authors should think to put the paper into a more practical content (i.e. hands-on in the assessment of uncertainities like error propagation).

Section 5 Presentation of results and discussion very short.For example, I do not understand Fig. 10, and it seems to me the authors compare gas transfer velocities from the laboratory tank with surfactant activity of microlayers in the field. That would be hard to interpret, and should be at least described in a way that the readers understand what was done. Did the authors fill microlayer samples into the tank, too?

Overall, the manuscript presents a state-of-the-art laboratory tank for the investigation of air-sea gas exchange of climate-relevant gases. I recommend the manuscript for publication after adressing the reviews.

Interactive comment on Ocean Sci. Discuss., 11, 693, 2014.