

Interactive comment on “Technical Note: A minimally-invasive experimental system for pCO₂ manipulation in plankton cultures using passive gas exchange (Atmospheric Carbon Control Simulator)” by Brooke A. Love et al.

Anonymous Referee #2

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General comments: The manuscript is well structured and clearly written. This novel system is well thought out and I believe it to be an important contribution to the task of ocean acidification studies. The introductory material presents well the advantages and limitations of various approaches. Also the system is described in a sufficient way. Although, this is the microcosm study, which has various limitations, the authors acknowledge and describe most of its limitations. Despite that, I think there is also one limitation of this study, which should be mentioned. These are the factors which affect the gas transfer velocity, hence gas exchange with the atmosphere. As this is a closed system, in reality the gas exchange with atmosphere could be (and most likely is) quite

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distinct from what it could be observed in microcosms. As in reality it is affected by wind speed, convection etc. , lack of these factors in microcosms may limit the realism of the experiment. Beside that, also, are ions monitored as well? The ionic strength also affects CO₂. And I think it should also be added, what is the volume of each vessel?

I particularly appreciate the possibility of using different, controlled atmospheres. This could be especially useful in stimulating past and/or future ocean acidification. This would be helpful in studies of the carbonate chemistry of seawater under past, present and future conditions, especially under ongoing climate change.

Specific comments:

in pCO₂ be p should be italicised

Line 18: Although for me it is clear what OA stands for, I think it should be explained anyway

Line 129: the lower case of 2 in CO₂ sys. And please explain: CO₂sys is the abbreviation for?

Line 143: -1 should be upper case

Line 155: “more than a dozen”: I think it is better to put the actual number of experiments than just the word “dozen”

Line 160, 419: *Emiliana Huxleyi* should be italicised

Line 167: should be just:” Hoffmann et al (2011).

Fig. 1 All the abbreviations should be explained, for example Sim. Ch. or Dist.

Fig. 3, fig. 4: pCO₂ is missing units

Supplementary note: Line 23: “minimal pressure”: what is the value of this minimal pressure?

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