

## ***Interactive comment on “Effect of elevated $p\text{CO}_2$ on trace gas production during an ocean acidification mesocosm experiment” by Sheng-Hui Zhang et al.***

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Increases of anthropogenic emissions of  $\text{CO}_2$  since the Industrial Revolution are known to have influenced organisms and the delivery of oceanic ecosystem services at a global scale. This is an interesting piece of work that shows the effect of elevated  $p\text{CO}_2$  on trace gases production including DMS and four halocarbon compounds through a mesocosm experiment. The study is based on the development of a bloom created by the addition of three different species of cultured phytoplankton to nutrient enriched coastal water enclosed in mesocosms. Considering that the impact of ocean acidification on DMS and halocarbons remains controversial, it is necessary to conduct

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further study about this aspect. Overall, this paper is well written and the major points are discussed with clarity. I recommend this article to be published in Biogeosciences after modification. My major criticism to the manuscript is that the authors point the algae and their attached bacteria in the coastal environment were removed through filtration process, have you measured the bacterial abundance in the mesocosm before the three different species of algae inoculated? In addition, this manuscript lacks the initial concentrations of *Phaeodactylum tricornutum*, *Thalassiosira weissflogii*, and *Emiliana huxleyi* inoculated into the mesocosm. There are also some minor thinks that I list below: P3, L54 “Further decreases of 0.3–0.4 pH units are predicted by the end of this century (Doney et al., 2009; Orr et al., 2005), which is commonly referred to as ocean acidification (OA).” Please update the latest references in this section. P3, L61 “DMS is the most important volatile sulfur compound produced from the algal secondary metabolite dimethylsulfoniopropionate (DMSP) through complex biological interactions in marine ecosystems (Stefels et al., 2007).” DMSP is not only produced by algae, but also by terrestrial plants and marine bacteria. Please re-word this section. P4, L75 Replace “attribute” by “attributed”. P8, L167-L168 What is “LC” and “HC”, low CO<sub>2</sub> and high CO<sub>2</sub>? Please use the full name for the first time in the manuscript. P8, L172 The unit of chl a is not unified with Fig. 1, please check. P9, L192 Replace “for” by “of” P9, L196 delete “growth in” P9, L197-198 Replace “increase in Chl a and cell concentrations” by “increase in Chl a concentrations and algal cells”

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