

Interactive comment on “Detection of regional scale sea-to-air oxygen emission related to spring bloom near Japan by using in-situ measurements of atmospheric oxygen/nitrogen ratio” by H. Yamagishi et al.

Anonymous Referee #2

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The manuscript from Yamagishi et al. shows a new method to measure O₂/N₂ ratios in-situ with high accuracy using a TCD. The in-situ results from Cape Ochiishi covering a one year period are compared to flask samples. The method seems to work fine although a small systematic offset is observed. This offset is not understood so far but can be corrected easily. Using back trajectories it is possible to link high oxygen concentrations to the occurrence of spring bloom. The manuscript is generally well written and suitable for publication in ACP. I have a couple of questions that I would like to see addressed by the authors before publication.

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Interactive Discussion

Discussion Paper



Most of the sampling and measurement procedure is discussed in great detail. When it comes to the actual measurement I am missing some information. - The -80°C coldtrap will fill up with time. What is the procedure to condition this trap? From the sketch I see that there are four traps. How is that working? - I understand that a column is used to separate N_2 from O_2/Ar . What type of column is that? If it is a 5A is accumulation of CO_2 a problem? - I could not find how big your sample loop is. Also are you alternating sample and standard or do you do less standards than samples? A figure with your detector signals might be interesting. -How long do you need for one measurement?

page 2232, line 5: delete “relatively”

page 2234, line 26.: I doubt that the back pressure regulator is causing the offset between flasks and in-situ measurements. At this high flow rate any fractionation at the back pressure regulator can not diffuse back to the sample intake unless there is a lot of turbulence.

page 2235, section 3.2: The observation of higher variability in the O_2/N_2 ratio than in the APO is not obvious to me. Can you quantify this observation? Also I do not understand why this is supporting a terrestrial source. Are you not explaining the fast O_2 changes with oceanic sources later on in the paper.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 2225, 2008.

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