

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 #1

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The paper By Yamagishi and coworkers reports on longer term measurements of O₂/N₂ ratios made at a station on the east coast of Hokkaido (Cape Ochi-Ishi, COI). The air masses passing by this location originate mainly from the Okhotsk sea and the western North Pacific. O₂/N₂ ratios are monitored quasi-continuously using a GC system similar to the flask analysis device developed by the same group. With an analytical precision of 14 per meg per sample the authors arrive at a precision of 6 per meg for the hourly mean values, which is sufficient for monitoring seasonal changes and synoptic events. By subtracting the terrestrial component an APO record is presented covering

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the time range from March 2005 to April 2006. The record exhibits excursions of up to +120 per meg between June and Sept. 2005. The authors attribute this observation to spring and summer phytoplankton bloom events in the surrounding oceans, producing extra-O₂ which leaves the oceans within 2-4 weeks (the corresponding CO₂ uptake requires a much longer time to be communicated to the atmosphere). In addition short term excursions probably related to terrestrial events are captured which are difficult to observe with flask measurements only.

The paper has a focus on the method which is presented as a new quasi-continuous O₂/N₂ analytical device performing well enough and similar to other continuous high precision oxygen analysis systems.

Specific comments / typos: Headline: ...measurements of the atmospheric oxygen/nitrogen ... p2227,l11: ...Alaska (CBA... p2228,l2: ...field based O₂/N₂... l19 ff: The fast sample flow...How exactly did you ensure that thermal fractionation effects are not relevant? p2230,l14: ...(Parker Balston... p2232,l2 ff: While the Ar/N₂ ratio remains largely constant in ambient air, this is not true for the air in cylinders which are used for calibration. Here, a correction for the Ar/N₂ difference is probably required?

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

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