

Interactive
Comment

Interactive comment on “Equilibrator-based measurements of dissolved nitrous oxide in the surface ocean using an integrated cavity output laser absorption spectrometer” by I. Grefe and J. Kaiser

Anonymous Referee #1

Received and published: 20 August 2013

Studies of N₂O emissions from oceanic areas were limited so far to discrete and labour intensive techniques. The development of oa-ICOS instruments in combination with an equilibration system allows a significantly larger spacio-temporal resolution of N₂O in surface waters, which should improve the N₂O emission estimates from oceanic areas. The presented manuscript shows N₂O concentrations and N₂O emission estimates of surface water measurements of a meridional Atlantic Transect. The topic and data are well prepared and discussed. I recommend the manuscript for publication at Ocean Science after the consideration of some minor comments.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



Comments:

1) P.1036 L. 1 “The equilibrator...” sentence unclear. Please rephrase. 2) P.1037 L. 17-19 Referring to the temperature dependent solubility of N₂O in seawater temperature probes with a precision of 0.01°C are recommended. 3) P.1037 L. 27 “Dried air with 323.7nmol/mol...” Please specify gas phase by adding N₂O? 4) P.1038 L. 21 “where u is wind speed at 10...” Please add m. 5) P.1038 L. 23 Did you consider Wanninkhof 2010? 6) P 1039 2.3 You introduce a new method for N₂O measurements in surface waters. The comparison to conventional methods like GC-MS measurements remains very short with only 3 CTD samples and no data shown and should be extended. 7) P. 1042 L. 4 “relaxation time (=3t)...” $t = \tau$? 8) P. 1042 L. 5 “increased t to...” $t = \tau$? 9) P. 1042 L. 6 “the value for t...” $t = \tau$? 10) P. 1044 L. 6 “It was difficult to keep the water flow through the equilibrator...” You mention the use of a seawater flow regulator in the summary. Why was the regulation of a stable water flow through the equilibrator still an issue? It significantly influences the N₂O measurements. 11) P. 1044 L. 24 Why is the coherence of upwelling and N₂O values not shown via correlation with oxygen values or temperature for verification?

Interactive comment on Ocean Sci. Discuss., 10, 1031, 2013.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper