

## ***Interactive comment on “Onboard measurement system of atmospheric carbon monoxide over the Pacific Ocean by voluntary observing ships” by H. Nara et al.***

### **Anonymous Referee #2**

Received and published: 7 September 2011

The manuscript ‘Onboard measurement system of atmospheric carbon monoxide over the Pacific Ocean by voluntary observing ships’ by H. Nara et al. describes in detail the analytical set-up of on-board CO measurements performed regularly on ship cruises from Japan. These measurements are an important contribution to the global picture of carbon monoxide since they are made in an area which is influenced by rapid changes in the emissions due to economic development in large parts of Asia.

General remarks:

The paper is well written and structured; however, some parts could be shortened (In-

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roduction and parts of section 3). Most parts of the manuscript are very technical (method/instrument description and comparisons), and a few results of scientific interest are presented after verification of the methods. Overall, the results and methods are sound, and the topic is suitable for publication in AMT. Therefore the manuscript should be published in AMT after consideration of the following mainly minor issues.

Specific comments:

According to Fig. 3 standard gases to not pass through the Nafion dryer unit. Was the Nafion dryer checked for CO losses?

Fig 4. shows a very nice linear relationship between GFC and VURF, but an offset of 16.11 ppb. Was the automatic zero measurement once per hour also used during this experiment, and if yes: Why do you see this offset? Such an offset would be very significant for ambient data.

Page 4520, Lines 2-4: Please state if the slope and intercept were significantly different from 1 and 0 or not. Overall, this is a very good correlation between the two methods.

Technical issues:

Page 4511, Line 6: Delete 'on the inner surface of stainless steel tubing'.

Page 4512, Line 1: Acronym STP needs to be explained

Page 4512, Line 5: Unit  $\text{kgf cm}^{-2}$  should be converted to a more common unit (e.g. Pa)

Page 4515, Line 16: '...a hydrophilic CO oxidizing agent': If it is hydrophilic, it should absorb some water and consequently change the humidity. Please check.

Page 4520, Line 9: ..and also no significant growth of CO in the flask, which is equally important.

Fig. 5: Unit is missing on y-axis (lower panel)

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