Atmos. Meas. Tech. Discuss., 8, C2145–C2147, 2015
www.atmos-meas-tech-discuss.net/8/C2145/2015/

Atmospheric Measurement Techniques Discussions

Interactive comment on "Intercomparison of two Comparative Reactivity Method instruments in the Mediterranean basin during summer 2013" *by* N. Zannoni et al.

Anonymous Referee #2

Received and published: 20 July 2015

This paper reports the intercomparison of two OH reactivity instruments that use the same technique but different detection system. I have found the paper interesting since intercomparison between OH reactivity instruments are sparse and this work is worth for other groups that are using or developing instruments for OH reactivity measurements. However before this paper will be accepted for publication, the authors have to address the following points:

1) It is not clear from the title and the abstract that it is mainly a plant emissions observation and that the OH reactivity measurements were carried out in an enclosure. In fact, only after 15 pages (at pg. 5080) it is explained that the ambient reactivity was

close to the LOD of the systems, so they decided to measure the reactivity of plants, placing the inlets in a small enclosure with plants to exclude ambient air. Therefore from lines 1-5 of pg. 5080, seems that, due to low ambient reactivity this study regards only plant emissions. Finally, on pg. 5086, lines 16-18 it is clear that the campaign was divided in three parts: 2 days of plant emissions (8-9 July), 2 days of ambient measurements (10-11 July) and 2 days (12-13 July) of plant emissions. In my opinion this mix of measurement (ambient and enclosure) must be cleared starting from the abstract. From fig. 8 seems that during the ambient observations the CRM-LSCE systematically overestimate the OH reactivity compared to the CRM-MD, whereas in the enclosure measurements for the same low level of OH reactivity the agreement between the two systems is much better. Is this discrepancy explainable? Is this due to a possible interference in the CRM-LSCE in ambient atmosphere?

2) I'm not sure that mixing the data (enclosure and ambient) to carry the intercomparison is fine: how about the observational environment? Since the enclosure is completely different from the open atmosphere: Are you confident that you were in the same situation in terms of possible interference and/or instruments performance that you allow to consider and analyse all the data together?

Minor comments:

a) Pg. 5078, lines 15-14: The length of the sampling lines of the two system is very different: 30 m. vs 5.5 m. You acknowledge a similar residence time and a Teflon pump for the system with the longer line. I suppose that the pump is placed between the line and the reactor to have a similar residence time. If this is the case, please specify this and all other evidences that show that the intercomparison is fine even if the experimental setup is different for the two systems.

b) Pg. 5084, lines 3-4: The humidity correction results in an increase of the CRM-LSCE reactivity and in the decrease of that of the CRM-MD: how do you explain this opposite behavior?

AMTD
8, C2145–C2147, 2015

c) Fig. 7: For all the panels there is a group of data where there is a big difference between the two systems: the CRM-MD measures between 50 and 100 s-1 of OH reactivity, whereas the CRM-LSCE between 0 and 50 s-1. Do you have an explanation for this?

d) Fig. 8: A log-scale in the y axis would be better to help to see details of the low OH reactivity measurements.

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 5065, 2015.