Atmospheric
Measurement
Techniques

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**Discussions**

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*Interactive comment on* "**Automatic processing of atmospheric $CO_2$ and $CH_4$ mole fractions at the ICOS Atmospheric Thematic Center**" *by* **Lynn Hazan et al.**

**Anonymous Referee #2**

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The paper does represent a substantial contribution to scientific progress in terms of new measurement techniques. It describes (in detail) the data processing procedures of the ICOS ATC, and this description is required as more countries join the European ICOS network. It is of vital importance to ensure the comparability and consistency of data submitted to an integrated EU network.

The paper is well written and the scientific methods applied are appropriate. The figures and tables are in the main well presented and add to the understanding of the results explained in the text.

Specific comments: P4 L18. The problem with keeping a target tank for 10-20 years is that the mole fractions will be so far removed from ambient levels (assuming the current

growth rate for CO2 and CH4), that instrument non-linearity effects might dominate the comparison.

P8 L9-19. To what extent can the differences be attributed to wet-dry sampling as opposed to instrumental differences between a G1301 and a G2301?

P8 L20-29. The text and Figure 7 are confusing as they show a comparison of data before and after water corrections – however, some of the instruments use physical dryers (which could bias the data), however, the information detailing which sites are using dryers is not given.

General comments: P3 L1-2. Text does not read very well, try – "Because this paper is focused on CO2 and CH4, only analysers deployed in the monitoring network that measure these gases have been considered". P3 L4. Don't Los Gatos off-axis instruments meet ICOS requirements? P3 L28. Text does not read very well, try "uses an open-source content management system framework (Drupal)". P4 L2. Replace are with have been P4 L4. Replace are with have also been P4 L27. Each instrument does not flag their raw data, the instrument operators flag the data, or setup the parameters for automatic flagging or someone at the ICOS ATC sets this up? P5 L 7 ICOS-MSA, 2014 is not listed in the references. P6 L 5. Change "we are scanning" to "each data point is scanned for" P6 L8. Change the "we" so something else. P7 L3. Shouldn't the unique identifier be #111 and also in Figure 3, it should be AMS #111 no AMS 111. P7 L6. It looks more like stabilization is reached after 4-6 mins in the AMS #111 example. Figure 4 also indicates that ∼20% of CO2 values are not reached within a 10 minute period. P8 L23. States that the Mace Head instrument is close to zero because it is using a dryer system , however the MHD #41 instrument shown in Figure 7 does not use a dryer? P9 L1. WMO scale for CH4 was updated in 2015 to WMO X2004A P9 L13. What happens if the values plotted do not follow a liner function? Or the calibration sequence mole fraction range do not cover the ambient mole fraction range? P15 L19. What does this refer to in the Manning reference? K., S., R., S., L. P., S., J., T., Y., T., R. L., V., 20 A., V., F., and Worth, D P15 L 21. Should the reference link be:

http://cucumbers.uea.ac.uk/documents/2014_InGOS_NA3_Cucumbers_Report.pdf
P16 L 6. Yver Kwok, C