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Earth System
Science Data
Discussions

Interactive comment on "Mesospheric CO above Troll station, Antarctica observed by a ground based microwave radiometer" *by* C. Straub et al.

Anonymous Referee #3

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In the publication

'Mesospheric CO above Troll station, Antarctica observed by a ground based microwave radiometer' by Straub et.al.

measurements of atmospheric CO are described and compared to CO measurements derived from MLS and CO modelled by SD-WACCM.

The authors briefly describe the instrument and a correction which was necessary due to a degradation in one of the spectrometers. They proceed using the corrected time series to compare the instrument against MLS and SD-WACCM data.

General:

While the publication is about the announcement of data in accordance to the purpose of the journal, I would not expect scientifically new results. Nevertheless, I would expect such a paper to take into account the results obtained in publications which appeared recently and discussed in great detail the comparison of ground-based measurements of CO to both, satellite instruments and a model. However I found only one recurrence to the work of Hoffmann (2012), where quite off-handed is said, that Hoffmann (2012) found also good agreement of the ground based data to the MLS data. I would expect a bit more depth in the discussion of previous work.

Also I would expect more information about the dataset: In 2009 a severe change in the spectrometer appeared. Nevertheless nothing is said, if the spectrometer has been repaired. The time series stops at the beginning of 2010, but the publication is from 2012. Did the instrument stop working or has it been retrieved for repair?

Therefore I recommend the publication only after it has been brought up to date to the stand of research.

Specific:

page 2 line 21, only one order of magnitude? Acc. to your figures it would be more.

page 2 line 25, please add a citation of where you got the lifetime of polar night CO.

page 3 lines 18-20 the publication does not only describe the measurements but also compares them to other data. Please note this and add a citation that this has been done before and by whom.

page 5 line 16, the information that there are 98 days without measurements is completely unconnected to the surrounding text. Why is it relevant anyway?

page 12 line 13, 14, Are your results better or worse than in this study?

page 13 line 1-3 Hoffmann (2012) present a detailed analysis of the correlation analysis. They also tried to find if the correlation coefficients are meaning full. Are you

implicitly using the same line of argumentation? If so you should cite it, if not, why not?

Why means that the 5-sigma renders the correlation to be significant?

page 13 line 15. I don't think this conclusion is valid. Because you are changing your a priori using SD-WACCM profiles I would expect that the correlation of the apriori to SD-WACCM is already quite high.

I especially worry about the fact, that the correlation to SD-WACCM after the correction is higher in the time when the BAS spectrometer had to be corrected (2009).

I think a correlation of short term variation as done in Hoffmann (2012), chapter 4, would reveal much more valid conclusions.

page 22 figure 5 I guess the AVK are not normalized to the apriori profile?

page 25 figure 8 What is the dashed line in the middle plot? What is meant by the "combined random errors" in the right panel? How are the plots interpreted.

page 26 figure 9 The right panel does not seem consistent with figure 7. The values of MR (BAS?) and SD-WACCM after 2009 seem less correlated than 2008. Figure 9 show different. Is this because the model values have been convoluted in figure 9?

Interactive comment on Earth Syst. Sci. Data Discuss., 6, 1, 2013.