Review of "Re-analysis of ground-based microwave ClO measurements from Mauna Kea, 1992 to early 2012" by B. J. Connor at al.

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This paper presents the re-analysis of 20 years of stratospheric ClO profile measurements acquired by a ground-based microwave radiometer located at Mauna Kea. The authors compare the results to the previous analysis of the same data and to profiles from the Microwave Limb Sounders on the UARS and Aura satellites. They find that the re-analyzed data set shows less short term variability and exhibits a more constant long term trend around the peak of the relevant ClO mixing ratio profile. Such a re-analysis of a long term data set is certainly of interest however, in my opinion the paper needs to be revised before it is suited for ACP.

General comments

I am not yet entirely convinced that the new analysis indeed delivers more reliable results than the previous one. I would imagine that the subtraction of a night spectrum from a day spectrum could lead to a decreased sensitivity of the retrieval in the upper stratosphere. If, as you say on p. 30573, l.3, upper stratospheric ClO shows little diurnal variation I would expect that by subtracting the night from the day spectrum the information coming from that altitude is removed.
In order to convince the reader that this is not the case, or at least does not affect the altitudes you present your trend estimate at, you should show the AVK for both analysis. In addition, I would like to see a comparison of the time series (as in Fig. 5) of both analysis methods against the collocated MLS profiles convolved with the AVK of the radiometer.
When you reference figures you often refer to panels a) and b). I think you should indicate which is panel a and which is panel b in the figures.
Use either hPa (as in Fig. 6) or mbar (as in Fig. 4) as pressure unit but do not mix them. However, I assume that what you use in Fig. 4 is not mbar but Pa - this is at least what would mach the altitude scale...

Specific comments

p. 30573, l. 2-3: Give altitudes here.
p. 30573, l. 4: (except in polar spring), why?

p. 30573, l. 16: I do not find it good to start this section with the failure of the instrument. Say something positive first. I would like to know how long you need to integrate before you have a spectrum suited for the retrieval and how often you are actually measuring usable spectra.
p. 30573, l. 26: (panel a) and (panel b). In the figure caption you refer to top and bottom.
p. 30574, l. 2: This "interpolated night" spectrum ... ... by the ClO emission. - Reformulate.
p. 30574, l. 4: ...last section... Do you mean the previous section. Could you maybe say ...in the introduction... instead?
p. 30574, l. 6: What do you mean with ...all instrumental signals. Is it the baseline you are talking about? In this case you contradict yourself two lines later when you say: However, the interpolation function does not match the instrument baseline exactly.
p. 30574, l. 27: In Antarctic spring, ... analyzed day-night spectra. Remove these sentences as they do not concern the measurements from Mauna Kea.
p. 30575, l. 7: I would like to have a short description of the retrieval set-up of the new analysis (are you using optimal estimation, what kind of a priori are you using - constant or varying with season...) or at least a reference.
p. 30575, l. 19: Seasonal variations, of 3 to 12 months period, have been separately derived... How?
p. 30576, l. 16: ..., have both smaller error bars,... How are you estimating the errorbars of the yearly mean? Where are the differences between the two analysis coming from?
p. 30577, l. 4: Are you using Aura and UARS day - night profiles for this comparison?