The manuscript “Performance Evaluation of THz Atmospheric Limb Sounder (TALIS) of China” by Wang et al. has been significantly improved compared to the first version. I still have few minor comments before it could be published. Though the manuscript is clearly written, they are still few English mistakes that should be corrected.

I found inconsistency in some figures given in the text that should be checked (see list of comments).

They may be due to misunderstanding on my part.

Minor comments:

Abstract

A sentence on the comparison with AURA/MLS should be added in the abstract.

P2 L17: “other abundant chemical species” -> “other trace chemical species”

P3P8: “5.5, 3.8, 3.3, and 0.96 km, respectively.” -> “5.5, 3.8, 3.3, and 0.96 km at 118, 190, 240, 640 GHz, respectively.”

Table 1: Since there is an angle offset between the radiometers, how are defined the LOS angles?

I have trouble to understand the relationship “0.1 s integration time -> 1 km tangent height spacing”.

If the total time for scanning from 0 to 100 km is 28 sec (36 - 5-3), 0.1 sec should be 0.35 km (100/28.*0.1). Do I misunderstand something?

P5L9-10: I would recommend the authors to add the MLS reference on the 118 GHz line processing since their analysis of this line is not complete (e.g., Zeeman effect). [Schwartz et al., EOS MLS forward model polarized radiative transfer for Zeeman-split oxygen, IEEE Transactions on Geoscience and Remote Sensing, doi:10.1109/TGRS.2005.862267]

P6: A reference with MLS HCl could be added. For example: Lary, D.J., O. Aulov, "Space-based measurements of HCl: Intercomparison and historical context", *Journal of Geophysical Research 113*, D15S04, doi:10.1029/2007JD008715, 2008

P11L8, The reference given by the authors in their answer to my first review (referee 2) should be given (“Skou N, Vine D L.: Microwave Radiometer Systems: Design and Analysis, Norwood Ma Artech House P, 2006, 26-27”). Also the fact that the noise equivalent bandwidth of a DSB receiver is twice that of a SSB receiver should also be indicated explicitly. For example: “When it comes to DSB radiometer, the ϵ need to be divided by sqrt(2) and \beta is twice that of the SSB. ”

This equation gives the noise STD expressed in the unit of “brightness temperature” (Rayleigh Jeans temperature) but the authors explained in their answer to my first review that they do not use this unit. They should clarify the unit issue here.

P12, Eq16: I think the equation is not used and should be removed.

P12L9-11: The following section is not clear:

“The ideal rectangle channel response function is used. The simulation antenna patterns of the four radiometers are shown in Fig. 8. As the antenna calibration can be done by a linear function, it has no impact on the following simulation, so antenna pattern is not added in simulation below.”

Do the authors mean that they use an ideal rectangle channel function instead of the antenna patterns in Fig 8 ? If yes, they should rephrase it and indicate the widths for all radiometer (one function per radiometer). I think that such an approximation is fine for the error estimations presented in this study, but it has to be clearly explained. Note that the scan vertical velocity should be taken into account.

What does “antenna calibration” mean in “As the antenna calibration can be done by a linear function, it has no impact on the following simulation, …”?

P12L15: It is stated that “… the spectra are obtained every 2.5 km.” but in Tab. 1 it is shown 1 km. What is the correct value?

P12L15: Is “we use 2.5 km as the vertical resolution” for the retrieval layer? This statement is unclear. Is-it the tangent height spacing or antenna FOV vertical resolution or the retrieval layer resolution?

P12L7: “The retrieval grid resolution is 1 km below 25 km, 2.5 km below 50 km, and 5 km above 50 km.”

The choice of 1 km for retrieval layer below 25 km should be explained. In my point of view it is not an “optimal” choice for 2 reasons: 1) it is not consistent with the 2.5 km spacing of the tangent heights, and 2) only the 640 GHz radiometer can measure with a resolution better than 1 km.

P13L8: I still have trouble with the noise estimation. If I applied Eq 9 to the DBS receiver and taking into account that beta is 2 x spectrometer bandwidth I have:

Noise STD at 640 GHz = 3.35 K (=3000/ sqrt(0.1*4.e6)/sqrt(2), with dt = 0.1 sec, beta=4.e6 Hz)

This value is smaller than that given by the authors (5 K) by a factor close to sqrt(2).

Also the radiometer should be indicated in the sentence:

“… to be 2 K, 1.7 K, 1.7 K, and 5 K , respectively.” -> “… to be 2 K, 1.7 K, 1.7 K, and 5 K at 118, 190, 240, 640 GHz, respectively.”

Fig9: The plots on the third panel are not visible. A log scale should be used.

P15L1: What is the error covariance matrix considered here: Sm (Eq 15) or Sm + Sn (Eq 15 and Eq 16)?

In several figures (e.g., Fig 13), the retrieval error is larger than 100%. How it is possible if the a priori error is set at 100%

P15L10: The altitude range for good retrievals should be indicated (15-85 km).

P15L12: It is difficult to check the vertical resolution between 15 and 25 km, though the value of 2.5 km looks correct above 20 km. Below 20 km the resolution looks poorer.

P15L13: “and TALIS is lack of the information.” -> “where TALIS lacks sensitivity.”

P15L15: The authors should provide values to support the statement. For example:

“is better in in the upper troposphere (error of 2 K for a vertical resolution of 3-4 km between 10 and 15 km)”

P17L7: It worth to indicate that O3 can be measure down to 10 km but with relatively low precision (50% and vertical resolution of 3-5 km).

P21L4-8: I think the diurnal change of ClO should be discussed. The ClO profile corresponds to daytime and the nighttime relative precision will be worse between 30-40 km (ClO vanishes during nighttime).

In the polar regions, the relative precision will be high between 20 and 25 km during chlorine activation.