Dear Referee#2,

We would like to thank your suggestions in order to improve our manuscript, which are fully addressed below. Your comments appear in bold.

Best regards,
Omaira García et al.

Specific comments

1. About the quality assessment and empirical validation of the OTC retrieved from the TCCON spectrum In Appendix B, the authors presented the results of the intercomparison between the OTCs retrieved from the NDACC 1000 cm-1 and TCCON 4030 cm-1 spectrum by using a same manner in Section 4. As mentioned above, this is one of the key issues of the paper and I recommend to include in the main body (for example, in Section 4.2), because a contribution of TCCON FTIRs to the global ozone dataset is highly desirable and the quality assessment of the TCCON OTC dataset presented in this paper is valuable for the research community.

The focus of this paper is to examine the possibility of monitoring the ozone total column (OTC) amounts from solar absorption spectra in the near infrared spectral region. In this sense, we demonstrate that the ozone signatures in 3040 cm^{-1} - if measured at a high spectral resolution (about 0.005 cm^{-1}) – provide OTC amounts with a high quality. This is the key finding, useful for TCCON sites. Several FTIR spectrometers within the TCCON currently operate an InSb detector to cover this spectral region. As mentioned in Conclusions, having such detector and recording the solar absorption spectra in the 3000 cm^{-1} spectral region at high spectral resolution (0.005 cm^{-1}) might be desirable and useful for TCCON sites. Hence, both NDACC and TCCON ground-based FTIR experiments might contribute to global ozone databases. Please note that the OTC is not an operational TCCON product.

The comparison shown in Appendix B between the OTC products obtained for the NDACC operational mode (spectral region of 1000 cm-1 at 0.005 cm-1) and for the TCCON operational mode at Izaña (spectral region of 4030 cm-1 at 0.02 cm-1) is very interesting and provided an added value to the paper, but it is a secondary result.

For these reasons, we would prefer to keep this TCCON and NDACC comparison in the Appendix B.

2. About the long-term stability The authors discussed about a discontinuity of the OTC time series in December 2009 by using a robust method, and explained that this was likely due to the increase of the spectral noise level after modifications on the instrument. However, as seen in Figure2, large scattering of the phase error also seems to appear since December 2009. Does it affect to the OTC time series? Did you adopt the measured ILS parameters in OTC retrieval?

The ozone total column amounts are retrieved considering the actual modulation efficiency and phase error curves, which define the Instrumental Line Shape (ILS) time series (solid lines in Figure 2 of the manuscript). These smoothed ILS curves are obtained by interpolating the individual ILS obtained from the low pressure N2O cell measurements taken every two months. Thereby, the different change-points/dips observed in the ILS time series (e.g. in December 2009) are properly taken into account in the FTIR OTC retrievals.

Our theoretical error estimations reveal that the random errors are dominated by the ILS uncertainty, especially for the 1000 cm^{-1} and 3040 cm^{-1}: 0.5% and 1%, respectively, assuming an error of 0.01 rad in the phase error (please note the random error associated to the ILS is mainly due to the phase error contribution). Nonetheless, this value is very conservative. If we consider a more realistic uncertainty for the phase error, e.g., one standard deviation of the dispersion around the smoothed ILS curve (0.002 rad, one fifth of the assumed phase error

uncertainty), the random error due to the phase error is reduced by five, i.e., from 0.5% to 0.1% for the 1000 cm^{-1} region, from 1.0% to 0.2% for the 3040 cm^{-1} and from 0.1% to 0.025 for the 4030 cm^{-1}. Thereby, the impact of the ILS on the OTC retrievals is expected not to be critical. Also, note that we do not observe any significant difference between the dispersion in the phase error time series before and after the change-point detected in December 2009: it is about 0.002 rad for the all optical path differences.

Minor comments

1. Page 2075, Line 10: Does "the average number of FTIR measurement days" include both the NDACC and TCCON measurements?

The average number of FTIR measurement days of about 100 per year includes only the NDACC measurements.

The Izaña FTIR site is a TCCON-NDACC mixed site, where the near-infrared and mid-infrared measurements are alternated. The TCCON measurements require a change of the spectrometer's beamsplitter performed by trained personal, thereby the number of the TCCON measurement days is normally lower than NDACC ones. At Izaña, we take on average about 100 measurement days per year under NDACC operation and about 70 per year under TCCON operation. These values are calculated considering the whole FTIR time series available at Izaña (1999-2012 for NDACC and 2007-2012 for TCCON).

We will clarify this point in the revised manuscript.

2. Page 2075, Line 18: What does "official" mean? Are they defined or authorized in some documents of NDACC (or sub-groups)?

With the term "official" we meant the standard spectral region used as a reference by all the NDACC ozone community. This spectral region has been agreed by all the IRWG-NDACC FTIR groups as recommended in the IRWG guideline "IRWG Uniform Retrieval Parameter Summary" (available at the IRWG-NDACC site http://www.acd.ucar.edu/irwg/irwg_info.html).

To avoid confusions, we will replace the term "official" by "standard" in the revised manuscript.

3. Page 2077, Line 4: "LINEFT" may be "LINEFIT".

"LINEFT" was a typo. It will be corrected in the revised manuscript.

4. Page 2077, Line 5: "(Hase, 2012)" may be "Hase (2012)".

The reference will be corrected following the referee's suggestion in the revised manuscript.

5. Page 2077, Line 12: Please define "b" in the text.

The definition the variable "b" will be included in Section 3 of the revised manuscript as follows:

"The atmospheric solution state $\hat{x}$ can be written down as a linear combination of the a priori state x_a and the real state x, the real and estimated model parameters b and $\hat{b}$, respectively, and the measurement noise $\in$:"