

Answer to Editor suggestions

Thank you for addressing all of the reviewers' concerns. Once you address the minor suggestions listed below, the manuscript will be ready for publication. Please improve the quality of the figures before submitting the next version. In addition, please unify the color scales as suggested by the reviewers.

The quality of the figures has been improved as well as the use of similar color scale for Figure 4 and 8.

L5 Define SAOZ done

L5 AURA -> Aura done

L11,12 suggested wording: The ECC pump temperature for the period 2002–2007 has been corrected using a linear altitude- dependent increasing rate of 0.33 K/km. As a result, the corresponding ECC ozone bias at 25 km with the stratospheric lidar and MLS have been reduced to -0.5 %. done

L14 is expected considering the decrease -> is expected due to the decline of ozone ... done

L14, 15 because of -> following the implementation of the Montreal done

L16, 18, the "e.g. needs to be inside the reference bracket, for example (e.g., Riese et al., 2012) done

L22 The ozonesonde -> An ozonesonde is a ... done

L42 Delete "The" done

L42 ozone vertical profile every week -> vertical ozone profiles on a weekly basis done

L46 weird symbol in the volume flow rate units, is it suppose to be cm³ s⁻¹? Yes this is the symbol used in the WMO GAW report # 268 for the flow rate.

L46 its temperature -> the pump temperature done

Equation 1 delete the dots done

L58 are -> is done

L58 delete "at pressure smaller than 10 hPa" is already implied by "above the 10 hPa pressure altitude or above the balloon burst altitude" done

L62 1524 suggested wording: i.e., only 3 soundings out of 1524 are excluded from the database done

L68 MODEM -> Modem done

L88 the correct reference for MLS ozone level 2 is Schwartz, M. (2021). MLS/Aura level 2 ozone (O₃) mixing ratio V005 [Dataset]. NASA Goddard Earth Sciences Data and Information Services Center.

<https://doi.org/10.5067/AURA/MLS/DATA2516> done

Line 96 thickness ***centered*** at 25 km done

Figure 1 caption J uly -> July done

Line 115 ECC pump flow rate, Omega_p, is expected Sentence rephrased to match the caption of Fig. 3 where we actually show the time to pump 100 ml of air.

L121 is this ENSCI the same as EnSci mentioned in Line 67. If it is, please use only one spelling, preferably EnSci done

L122 suggested

+wording: The ECC serial numbers associated with soundings exhibiting TCO decreases larger than 3–5% were above 20,000. done

L126 ECC internal pump temperature, T_p, correction is ... done

L130 Overall, values are in the range ... done

L132 MODEM -> Modem done

L132 However, (add comma) done

L132 has often dropped in the range -> frequently dropped within the range ... done

Figure 3 add the median, as horizontal lines, for each period to be able to see the differences. This will also match the other figures. Done The red horizontal bars correspond to the median values shown in Fig. 6.

Figure 4 please draw the vertical lines in a color that is not within the colorbar, for example, black or gray **done**

Figure 7, Please overplot the 0.4K/km. how do you deal with the jump between 10 and 20km? **Done.** The two periods 1991-2001 and 2002-2007 cannot be strictly identical because of differences in the atmospheric temperature profiles. The temperature jump at 10 km correspond to changes in the tropopause altitude. This is why we test several temperature corrections in section 4.3

Section 4.3 This entire section is confusing because you have, version 0, 2, 3, and 4, but not version 1. Please change to either version 0, 1,2, 3 or version 1,2,3,4 **We agree it is better to label the no-correction case as version 1. We change Fig. 9, 10 and 11 accordingly.**

Figure 10, Why are you using version 2 here. I thought version 3 was the best option (L214) **In fact there is a mistake in caption of Fig. 10, what is shown is indeed the difference between version 3 and 1 (so Editor suggestion to use of the wording version 1 to 4 is a very good suggestion !)**

Figure 11: it is really hard in this figure which version is better. The brown lines are really similar, could you overplot them in the same panel? **We added the 1.0 line in Figure 11 to emphasize the version-4 minimum of the normalization factor in 2002-2007.**