

Atmos. Meas. Tech. Discuss., referee comment RC2 https://doi.org/10.5194/amt-2021-399-RC2, 2022 © Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.

## **Comment on amt-2021-399**

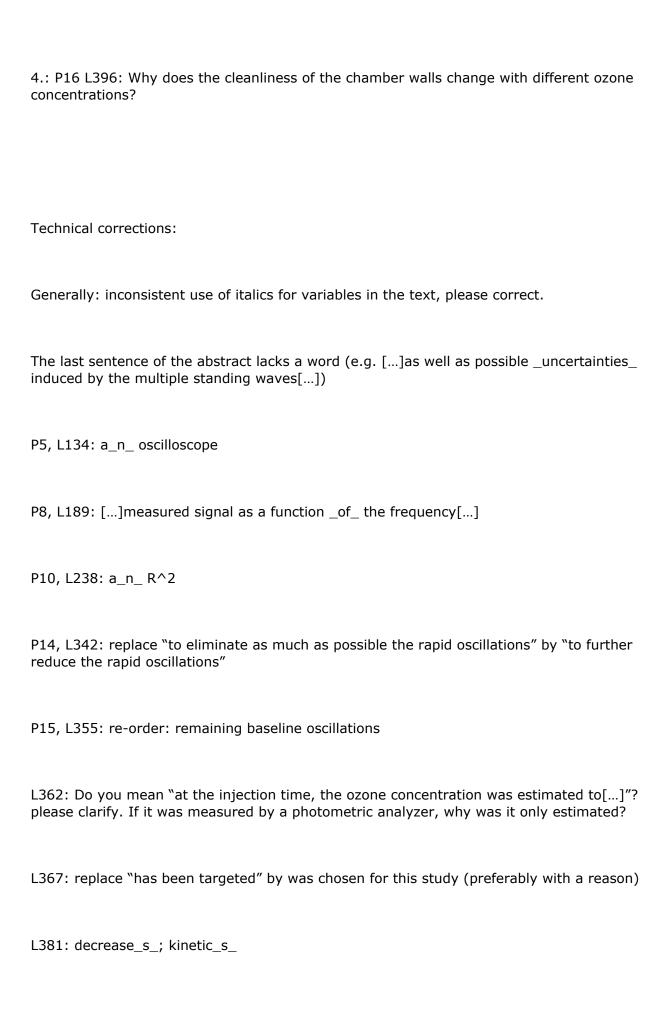
Anonymous Referee #2

Referee comment on "MULTICHARME: a modified Chernin-type multi-pass cell designed for IR and THz long-path absorption measurements in the CHARME atmospheric simulation chamber" by Jean Decker et al., Atmos. Meas. Tech. Discuss., https://doi.org/10.5194/amt-2021-399-RC2, 2022

The authors describe the successful characterisation and quantitative measurement capabilities of a new optical absorption instrument called MULTICHARME installed at the CHARME atmospheric simulation chamber in Dunkirk. The instrument is capable of measuring rovibrational transitions over the range of infrared to THz radiation with path lengths from 120 m to 280 m in the THz and up to 540 m in the IR range. Measurements of  $N_2O$  and  $O_3$  are shown, highlighting the potential for the distinction of isotopic composition and kinetic investigation.

## Specific comments:

- 1.: Why was a zero-biased detector chosen for the THz radiation, instead of a typically more sensitive, powered alternative?
- 2.: On Page 15, Line 370 you describe the loss processes for ozone before your THz measurement begins. However, if the losses occurred already during the ozone injection, the photometer should also have shown a lower value, no? And also, how long is the pumping time to reach the THz measuring pressure, such that it could explain the loss of half of the ozone? Is this consistent with the resulting wall losses in Section 3.2.3?
- 3.: Can you elaborate on the relatively larger error bars for the ozone detection between ~460 and 600 minutes in Fig. 8b, also with respect to how the LOD for ozone was determined?



L382: double "due"

P16 L393: \_a\_ UV-photometric

L397: extra space before comma

L399: extra space behind and; dependencies or dependency, not dependences

P17 L429: there is a red dot after LODs

L430: in, not into