

## Notes on minor revision made to egusphere-2025-4477

The authors would like to thank the two anonymous reviewers for their constructive comments and suggestions that have helped improve the quality of this manuscript, and Daria Karpachova for the manuscript check. The manuscript has undergone a very minor revision according to the reviewers' comments. Please see below our responses. For the reviewers' convenience, we have highlighted significant changes in the revised manuscript in [blue](#).

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### Reviewer 1

**Reviewer Comment 1.1** — Please check the TROPOMI processor version for SO<sub>2</sub>. To my knowledge, the COBRA algorithm was introduced to the operational processor in v2.7, while v2.4 is still the initial DOAS-based algorithm.

**Reply:** [Thanks for the comment. In this case, there was merely a confusion as I wrote we use the “The SO<sub>2</sub> product used here corresponds to the SO<sub>2</sub> pre-Covariance-Based Retrieval Algorithm \(COBRA\) product.” – hence, we do \*not\* use the COBRA product but the standard DOAS product. I fear the word ‘pre’ made the text too easy to misinterpret. I have rewritten this to “\[The SO<sub>2</sub> product used here corresponds to the SO<sub>2</sub> Differential Optical Absorption Spectroscopy \\(DOAS\\) RPRO product. The more recent operational RPRO product is obtained using the Covariance-Based Retrieval Algorithm \\(COBRA\\), which has significantly lower noise and a corrected bias in the retrieval.\]\(#\)” Hopefully it is now clear that we use the old product \(v2.4, as mentioned earlier in the same paragraph\) rather than the new \(v2.7\) product.](#)

**Reviewer Comment 1.2** — Please reconsider the unit. I understand the motivation for mol/cm<sup>2</sup>, but potential confusion is already large enough due to the “DOAS-heritage” unit (molec/cm<sup>2</sup>) vs. the SI unit in the operational product (mol/m<sup>2</sup>).

**Reply:** [Thanks; I \(Erik Koene\) already had all figures in molecules/cm<sup>2</sup>, but reported the noise performance in units of mol/cm<sup>2</sup> to get nice single-digit numbers. I have unified the units, though, such that now the noise performance is also given in units of molecules/cm<sup>2</sup> too.](#)

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### Reviewer 2

**Reviewer Comment 2.1** — Notification to the authors: Your supplement contains Appendix. Appendix should be included in main \*.pdf manuscript and supplement is an additional material. Please either move the appendix section to the main manuscript and delete supplementary material or adjust the names, titles and text in supplement accordingly (e.g. Figure A1 → Figure S1, etc.). More information about supplement: <https://www.atmospheric-measurement-techniques.net/submission.html#assets> → Supplements

**Reply:** [Thanks for spotting this – I originally had a rather large appendix section, and have moved this into the supplementary material as suggested by a reviewer, but this did not have the appropriate](#)

layout. I have renamed sections  $A \rightarrow S1$  (etcetera), Figure A1 to S1 (etcetera), and equations (1) to (S1) (etcetera).