Comment on acp-2022-647

Alain Sarkissian (Referee)

Referee comment on "Occurrence of polar stratospheric clouds as derived from ground-based zenith DOAS observations using the colour index" by Bianca Lauster et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2022-647-RC1, 2022

General Comments

This paper presents a very good application of ground based zenith sky DOAS observation using the Colour Index. Scientific objectives are very well introduced as well as the instrumentation used, the methodology and modelling. Discussion of the influence of tropospheric clouds, by presence and by extend show cases that can be extended further. The use of several wavelenghts ranges can help solving existing uncertainties and the radiative model simulations are very usefull for it.

The two stations explored for this analysis, one in Antarctica the second in the Arctic are very well identified for PSC detection, and more, extended to volcanic aerosol detection, as discussed in this paper.

Conclusion reflect well the work done in this paper and the abstract also. The choice of putting apendices for the algorith and for supplementary figures looks good for me

Special comments

No comments for the language as I dont fill as an expert

para starting l-241 : The authors have a discussion later in the text, please state it at the end of this para

Figure 7 : very good presentation

Figure 10 : Remove DOAS from Neumayer and Kiruna titles of the figures because it is not only DAOS and put it in the UV DOAS and visible DOAS in legends

Figure 13 : ...The triangles represent, I propose -> the black triangles at the bottom represent

Figure A1 and Appendix A could be in the main text, just before conclusion

Figures A2 to A4 : I assume it should be Figures B1 to B3

Appendix B : please more text, the legends of the figure could be ok