

Interactive comment on “Accounting for the photochemical variation of stratospheric NO₂ in the SAGE III/ISS solar occultation retrieval” by Kimberlee Dubé et al.

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Received and published: 26 November 2020

Specific comments

1. The uncertainty in the SAGE measurements becomes greater than 20% above 40 km (and below 10 km) so we did not want to focus our results on these regions. In addition, the NO₂ concentration gets very low above 40 km. When calculating the scale factors we divide by the NO₂ at the tangent point altitude. For tangent points above 40 km this results in dividing by a small number, which produces a large scale factor, despite the fact that the absolute difference in NO₂ might not be so large. This has been clarified in the manuscript.

2. This figure shows the scale factors from either side of the tangent point added together. This information has been added to the figure caption.

3. We only use the morning OSIRIS measurements (ascending node). A drift in the OSIRIS orbit resulted in many of the descending measurements occurring at night, when OSIRIS cannot measure, which affects the sampling. Because of this, it is common to use only the morning OSIRIS data. Using coincidence criteria of less than 24 hours did not result in large differences in the comparisons so we chose to have more data points in each bin. This has been clarified in the manuscript.

Technical corrections have been fixed.

[Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2020-331, 2020.](#)

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