

Interactive comment on “Local impact of solar variation on NO₂ in the lower mesosphere and upper stratosphere from 2007–2011” by F. Friederich et al.

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First, the authors would like to thank the referee for his careful review of our manuscript and his helpful and constructive comments. In the following I reply to each of the comments on behalf of all co-authors. The reviewer comments are given in black while our reply is provided in blue.

Specific comments:

- 1) p. 32335, lines 24-29, and p. 32336, lines 1-4: There is discussion of the large
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positive correlation at 65 +/- 5 degrees N geomagnetic latitude and altitudes 44-58 km in Figure 5. I am wondering about any possible significance of the large negative correlation, which is computed for 35 +/- 5 degrees S geomagnetic latitude and altitudes 50-62 km in Figure 5. Could the authors please elaborate on this as well?

The mechanism for this is not yet clear, but this is out of the scope of the paper. We have not mentioned it in the text, because due to the general comment of Referee 1 we now focus only on 0–80° N in this plot.

Suggested technical corrections:

- 1) p. 32328, line 16: Change “that” to “those”
corrected
- 2) p. 32329, line 7: Change “lead” to “led”
corrected
- 3) p. 32331, line 24: Change “for following” to “for the following”
corrected
- 4) p. 32336, line 9: Change “depending” to “dependent”
corrected
- 5) p. 32341, line 15: Change “Jackson” to “Jackman”
corrected

Additionally, we have cited a paper in the Introduction, released in the meanwhile:
Sinnhuber, M., Funke, B., von Clarmann, T., López-Puertas, M., and Stiller, G. P.: Variability of NO_x in the polar middle atmosphere from October 2003 to March 2004: vertical transport versus local production by energetic particles, *Atmos. Chem. Phys. Disc.*, 14, 1–29, doi:10.5194/acpd-14-1-2014, 2014.

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