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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.

Anonymous Referee #2

Received and published: 7 January 2014

General comments: This paper is well-motivated and generally well-written regarding the possible influence of electron precipitation on NO₂. The authors use nighttime MI-PAS NO₂ measurements along with a particular analysis technique, the superposed epoch analysis method, to find a small signal in the solar-driven constituent variations. They found a robust response in the NO₂ due to geomagnetic activity in the altitude range between 46 and 52 km at 65 +/- 5 degrees geomagnetic latitude in the spring/summer/autumn period. This is a very intriguing result showing electron precipitation impact to very low altitudes. I recommend that the paper be published subject to the authors considering one specific comment and five suggested technical correc-

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tions.

Specific comments:

1) p. 32335, lines 24-29, and p. 32336, lines 1-4: There is discussion of the large 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?

Suggested technical corrections:

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

Interactive comment on *Atmos. Chem. Phys. Discuss.*, 13, 32327, 2013.

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