

## ***Interactive comment on “Spatiotemporal variations of NO<sub>y</sub> species in the northern latitudes stratosphere measured with the balloon-borne MIPAS instrument” by A. Wiegele et al.***

### **Anonymous Referee #1**

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### **Review comment for manuscript acpd-8-4693-2008**

#### **General comments:**

Vertical NO<sub>y</sub> trace species profiles of the balloon-borne MIPAS-B spectrometer are investigated for spatial and temporal variations. Measurements were performed at high-latitudes inside and at the edge of the arctic vortex, around sunrise on March 21, 2003. The low duration of one limb profile sequence, of about 5min, allowed to compare the photochemical evolution of NO<sub>2</sub> and N<sub>2</sub>O<sub>5</sub> with photochemical box model calculations along backward trajectories. This paper is well written, referenced and structured. The work is suitable for publication in ACP, however, I would suggest some

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additions and alterations:

### Specific comments:

Issue 1: In the abstract and the conclusion only a qualitative statement is made about the difference between the modelled and measured  $\text{NO}_2$  and  $\text{N}_2\text{O}_5$  concentrations. Statements like (page 4694, line 12) 'the photochemistry in the model is slightly too slow' should be quantified. Furthermore, the box model could be used to perform sensitivity studies on the various parameters that influence  $\text{NO}_2$  and  $\text{N}_2\text{O}_5$  concentrations.

Issue 2: Page 4704, line 22: 'Time steps are 10 min and the output is obtained every hour' - does that mean that the values shown in figure 11 and 12 are interpolated between every one-hour time step? The values (circles) plotted in the figures seem to have time-steps somewhere between 5 and 10min.

### Technical comments:

1. Page 4695, line 28: Hyphenate balloon-borne.
2. Page 4696, line 8: In the abstract 14 to 31km are stated , here 14 to 32km.
3. Page 4697, line 11: As 'a' measure of...
4. Page 4705, line 18: Originating **form** the ...
5. Page 4715 and 4716: For clarity you could combine figure 2 and 3, e.g., by using a grey-scale for the tangent heights. At least it would be helpful to indicate the tangent points in Figure 3, i.e., it would probably be sufficient to show the tangent point at 14km.

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