

***Interactive comment on “Assessment of the NO-NO<sub>2</sub>-O<sub>3</sub> photostationary state applicability on long-term measurements at the GAW global station Hohenpeissenberg, Germany” by K. Mannschreck et al.***

**Anonymous Referee #2**

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The authors present a study about the frequency of the occurrence of photochemical steady state conditions (PSS) at the Hohenpeissenberg Station in Germany, and analyse the reasons for deviation from the photostationary state. Based on differences in the statistics for measurements performed at a preliminary station compared to measurements performed at the current building they identify the strong impact of local effects on PSS. The paper does not present substantially new scientific ideas, but the data analysis are of good quality and support known, yet only partly understood artifacts. In my opinion, the paper goes sometimes too much into detail, and making the text more focused would help an easier reading.

## Detailed Comments

Abstract, 1st sentence

change maybe to something like: Continuous measurements of concentrations of reactive gases and radiation and meteorological parameters ... (strictly spoken not the gases are measured but their concentrations). In average ... -> On average,...

Introduction

Page 2005, last paragraph

Mechanistically... -> Basically ...'

### 2.1 Measurement Site

I recommend to tighten the description and focus on the main points. The reader gets lost in all the details. Including a sketch would be of help too.

### 2.2 Measurement Program

Page 2010

I am certain, centralizing the calibration history of the filterradiometer would help for a more fluent reading. Why was the comparison of the JNO<sub>2</sub> data with model simulations not also done for 2002?

### 2.3 Data Base

How did you select the lower threshold value for JNO<sub>2</sub> of 6E-03 s<sup>-1</sup> for identifying clear sky days?

## 3 Experimental Results

Page 2012, 1st Paragraph, last sentence The maximum NO<sub>x</sub> concentrations observed for...

Page 2013, 1st paragraph

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Explain where you take the range of  $\pm 0.2$  for  $\sigma_{EXT}$  from or at least refer to the next section.

#### 4 Discussion

##### Page 2015

I suggest to include a paragraph and mention what you considered might be the reasons for the high PSS values that you are going to explain in the following. It would help to get an overview before you go into detail.

##### Page 2016, 3rd paragraph

Are the results for 1999 and 2001 similar?

##### Page 2017

It is unnecessary to repeat the exact characteristics of the measurement sites as they were mentioned in Section 2.1 already?

#### Figures

##### Figure 5

Why do you only show data from 1999?

##### Figure 6-7

Quantiles are typically defined between 0-1, i.e. the labeling in the Figures should be changed to from quantiles to percentile.

##### Figure 9

... measured ones ...

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Interactive comment on Atmos. Chem. Phys. Discuss., 4, 2003, 2004.

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