Interactive comment on "Relative drifts and biases between six ozone limb satellite measurements from the last decade" *by* N. Rahpoe et al.

Anonymous Referee #2

Received and published: 11 May 2015

The manuscript analyses systematic biases and drifts between ozone measurements from six different limb satellite instruments. Identifying such drifts and biases is an important first step when creating merged data sets and is thus of interest for the scientific community. However, I have some concerns on the presentation and discussion of the result which are listed in detail below.

Major comments:

1) Please provide more information in the Introduction on other merging activities and therein derived information on possible instrument drifts. SI2N is not mentioned at all.

2) Be consistent with the kind of information provided for an instrument in Section 2. Characteristics like satellite orbit, horizontal resolution, estimated uncertainty and

others are given for one or two instruments only.

3) Section 3: Provide information (here or later in the manuscript) on how sensitive your results are on the collocation criteria.

4) Basic information on the ozone data sets are missing. What is the vertical grid and coordinate used? If the data sets were transformed between altitude and pressure grid and between mixing ratios and concentration provide the relevant information on the methods.

5) Over which time period and grid are the mean relative differences $\Delta(z)$ defined?

6) Equation 6 is not correct since the error variable is missing.

7) I'm confused with section 4.1 and Figures 1-3. Why are the time series shown in the Figures if only absolute errors (averaged over time) are discussed in the text. The Figures show only a comparison of SCIAMACHY to the other instruments, but the text reads at various places like it would be based on a comparison between all instrument, e.g., ' . . . best agreement between all data sets . . . '. Line 1: Above 30 km, the differences are higher than 10%.

8) Last sentence of section 5 (page 3709, line 23-23): Is SMR really the only exception? What is for instance with MIPAS at 45 km in the SH midlatitudes? Figures 5-10 are very hard to read. Maybe you could consider showing the significant drifts only? Or using larger symbols for significant drifts? At the moment it is not clear from the Figures which biases or drifts are significant.

9) Regarding the comparison with other validation studies, please provide if and how the other two studies use a different methodology. Would you expect different results than Eckert et al.? How do your results of mean relative differences compare to other studies that are not based on pairwise collocated measurements? Such information is important to understand the possible advantages of your method.

10) Discuss the implications of your results for the CCI O3 merging activity, e.g., should

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the statistically insignificant drifts be ignored when creating essential climate variable records?

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 3697, 2015.

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