

## ***Interactive comment on “Characterization of In Band Stray Light in SBUV/2 Instruments” by L.-K. Huang et al.***

### **Anonymous Referee #2**

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The authors present a method to derive the In Band Stray Light for the SBUV/2 instruments on NOAA-14, 17, 18 and 19. These instruments have a slightly different depolarizer, which allows an unexpected multiple reflection of solar light for certain geometries.

In general, this is a straight forward description of the problem and how the suggested stray light correction function is derived. However, especially some of the figures need a revision to improve the quality.

#### **General remarks:**

There are three different notations for the different SBUV/2 instruments used: 'NOAA-xx' in the beginning, later 'Nxx' and occasionally 'FMx'. Please harmonize. My sugges-

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tion: leave NOAA-xx in the introduction and add, that this will be abbreviated with Nxx further-on, skip 'FMx' notation.

Sometimes 'Figure n' is used, sometimes 'Fig. n' in the text. AMT uses always 'Fig. n', please correct.

Many figures use dots, which are barely visible. Please check, if small points would give better results.

#### **Detailed comments:**

*Abstract:* I suggest to add already in the abstract the 4 for effected instruments, NOAA-14, 17, 18 and 19.

p 7913: please add also the approximate size of the ground pixel in km x km.

p 7916: line 15-18: Notation FMx instead of Nxx, see remark above.

p 7919: line 24/25 and Fig. 5: "The error bars are the statistical error for the mean." Please clarify, which mean you are referring to. Are the crosses in the plot points with error bars? Please add this information than in the figure description.

There is also a dashed and full line in the plots, which is not explained in the figure caption. Please add. Probably the use of colored lines would be helpful for the readers, especially the dashed line is hardly to distinguish from the points and its error bars. Anyhow, these lines are not explained anywhere in the text. Probably, p. 7918, line 25-27 refers to these lines. Please clarify.

Fig. 6: Something missing here? There are no triangles in the plot.

Fig. 8: Think about a color code to distinguish north and south data.

Fig. 9: This is obviously not a vector graphic, but a pixel based plot. Please provide the vector graphic here.

p. 7920: In general, the exact calculations in section 3.2.1 are hard to follow.  
From this page:

"Figure 9a shows the derived daily IBSL error at SCSEA = 18° at 273 nm as a function of time (dots) for N19. "

The dots are not visible in the plot!

"The normalized drift rates, derived from comparisons to reference values, are plotted in Fig. 9b."

"the normalized drift rates" probably means: "the drift normalized to the reference year"? Please formulate this sentence clearer. Why they are no dots in the reference year shown? They can be calculated the same way as outside this period.

"The average drift rate over 4 months before April 2010 and 4 months after March 2011 is calculated to determine the drift rate during the reference period, shown by the solid line.": Simply the mean of the two 4 months periods, right?

"IBSL changes during the reference period are then computed using the average drift rate, and added to the relative changes to give an initial estimate of IBSL time dependence, as shown by the dots in Fig. 9c, which is normalized to the first day of Earth radiance measurements."

Actually, I did not fully understand your calculations from this description. A formula might be helpful here.

p. 7920: l.18: "as shown by the dots in Fig. 9c": Dots in Fig. 9c are not visible.

p. 7922: 'line 1-2' : 'This process can be iterated if necessary.' Did you do an iteration or not? The calculations are finished... .

Fig. 10: add (a) and (b) in the plot.

p 7922, l. 16: excises -> exercises

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P. 7923, l. 15: "in terms of STDV " What is STDV? Please explain this acronym.

p. 7924, l. 1: "Fig. 14a" a/b is not marked in the plot and also not in the figure caption. Please add at both place.

p. 7925: I would like to read here a short discussion about the differences between the corrected instruments. Is the correction very similar for all 4 SBUV/2, or are there systematic differences?

p 7926: Conclusions

Please add the names of the 4 instruments effected by the ISBL error also in the conclusions.

In general, I suggested to add a small table with all SBUV/2 instruments listed, showing the name, the abbreviation used here, the flight model number, and if they are effected by the ISBL error.

After recognizing the listed comments, I recommend publishing this paper in AMT.

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Interactive comment on Atmos. Meas. Tech. Discuss., 6, 7911, 2013.

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