

## ***Interactive comment on “Calibration of the SBUV version 8.6 ozone data product” by M. T. DeLand et al.***

### **Anonymous Referee #1**

Received and published: 11 September 2012

This paper presents a comprehensive overview of all calibration procedures applied at the radiance level to height SBUV instruments. These calibrations are based on prelaunch and on-orbit measurements, inter-instrument comparisons and a soft-calibration procedure allowing small radiance adjustments of the different channels used for retrieving ozone profiles. All these calibration procedures are essential to make the individual radiance data sets as consistent as possible. These well-calibrated and -characterized radiance data sets, spanning together more than 32 years, consequently lead to a long-term ozone data record suitable for trend studies.

This work is very appropriate for AMT, and therefore I recommend publication after consideration of a few comments listed below.

## Comments:

- The main goal of all the calibration procedures applied to the SBUV spectra is to improve the consistency between the ozone profiles retrieved from the different sensors. The procedures themselves are clearly described. But the paper would greatly benefit from an illustration of the impact of these calibrations on the retrieved ozone profiles themselves, where possible. Is it possible to show how improved is the consistency between the ozone profile data sets from the different instruments as a consequence of some of the calibration procedures?
- In the snow/radiance method, it is mentioned that the small ozone absorption effect at 340 nm is easy to correct. Could you clarify how this is done? Is it based on a-priori information (climatology)?
- The term SBUV/2 is often used as a generic term (sections 2.2 and 2.3) making unclear if the calibrations presented there are also applied to earlier (S)BUV instruments. If this is the case, please replace SBUV/2 by SBUV. Otherwise, could you clarify in the text?
- Section 3.1: For the NOAA-16 and -18 instruments, an adjustment of the albedo calibration is realized based on a comparison of Antarctica measurements with some from the NOAA-17 SBUV/2 sensor. However, what is really intercompared is not clear to me. Are the radiances intercompared (this is what I understand from the manuscript) or the measured albedo (it would seem more logical in order to adjust the albedo calibration)? Could you clarify this?
- Section 3.2 - line 16: Are there any calibration adjustments at 340nm based on SS-BUV for NOAA-14? In section 2.4, it is mentioned that the on-board calibration is used for this instrument.
- Section 3.2 – lines 10-20: I would move Figure 18 here and refer to it.
- Section 3.2 : The method presented here to adjust the individuals channels appears

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to be applied to the NOAA-17 instrument only. Are there fundamental reasons why this technique can not be applied to the other instruments? Perhaps, it would reduce the need for inter-instrument calibrations.

- Page 5169 – lines 20-21: Was this error characterized on-ground? What is this reference photo-diode?

- Page 5171 – lines 7-9: Why is an adjustment needed to account for CCR variations? Are they not implicitly included in the observed radiance at 331 nm?

- Grating drive errors: How can a difference between the actual and the intended grating position be detected and quantified? In other words, how is the wavelength calibration quality estimated?

#### Editorial comments

- Page 5156 line 3: fit → fitted

- Page 5163 line 22: please quote the climatology used.

- Figure 8-9-10 : please homogenize the units for the x-axis.

- Page 5173 – line 16:  $60^{\circ}$ - $65^{\circ}$  →  $-60^{\circ}$ - $-65^{\circ}$  and  $45^{\circ}$  →  $-45^{\circ}$

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Interactive comment on Atmos. Meas. Tech. Discuss., 5, 5151, 2012.

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