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Discussions

Interactive comment on "A Calibration Procedure Which Accounts for Non-linearity in Single-monochromator Brewer Ozone Spectrophotometer Measurements" *by* Zahra Vaziri Zanjani et al.

Anonymous Referee #1

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This is the first review of the manuscript "A Calibration Procedure Which Accounts for Non-linearity in Single monochromator Brewer Ozone Spectrophotometer Measurements" by Zahra Vaziri Zanjani et al. This paper addresses a very important subject of the stray light interference in observations. Authors describe methods to determine stray light contribution in the Brewer total ozone column measurement under low sun conditions. The paper provides a very detail mathematical description of the Brewer measurement principles and the method to evaluate instrumental parameters that contribute to the non-linearity of total ozone derivation. The paper lacks in discussion of

the results. It provides only one case study (one day) to show that the approach works. If the mathematical model is correct, the fit to the single day of observations should work very well. Thus, the good fit is not a surprise. It is more important to demonstrate that the mathematical model can correct stray light continuously over the extended period of observations. It would benefit the reader to learn how well the mathematical model (determined from the limited set of data) would work if applied to a series of observations.

Several technical suggestion and comments 1) DB – may be change to DBr to avoid mixing with Dobson abbreviations. Then SB also should change to SBr for similarity 2) P.3 line 7 "The difference between the wings of the two slit functions" – did you mean it is a difference between measured and idealized? Please clarify. 3) P. 3 lines 18-19 "In the Brewer instrument, I0 is . . ." it is true not just for Brewer instrument, but also for any ground-based instrument that uses source of light to make radiative flux measurements. . .. May be change to the "The absolute intensity measurement by the ground-based instrument relies on the knowledge of the extra-terrestrial source of the light", or similar 4) P. 3, line 21-23 It is called differential absorption methods, also used in Dobson instrument. 5) P. 4 Eq. 2.1-2.4 – transition to eq. 2.4 is not clear (from intensities measured at two wavelength to the counts). 6) P. 4, equation 2. 5. Is absorption function written for one spectral channel of the Brewer instrument? Should alfa be dependent on the wavelength? Should there be a sum of the bj*NDj for all filters? 7) P. 4 line 11 – what does k represent? Is it number of Brewer spectral channels or number of observations? 8) P. 6, eq. 2.16 – This equation is compared to the Eq. 2.8. What is the order of this correction? Is it applied prior to iteration process (Eq. 2.8-2.13)? 9) P. 6. "Illustrated in Figure 5". Please add discussion of results shown in Figure 5. 10) Figure 6 is not discussed in the text.