

Review of the manuscript 'Performance of the FMI cosine error correction method for the Brewer spectral UV measurements' by Lakkala et al.

The manuscript describes a cosine error correction method for the Brewer instrument. The Brewer is a common instrument and as such the method and its performance warrant publications.

When reviewing manuscripts I am sometimes puzzled by the number of typos. Unfortunately the present manuscript is no exception. One can not help wondering how all the authors have managed avoid detection of the rather elementary spelling errors, some of which are listed below. Please use spell-checking software in the future. The manuscript is acceptable for publication after consideration of the suggestions for changes given below.

- **General comments:**

- The manuscript discuss snow free cases. However, the look up tables do include high-albedo cases. It would be worthwhile to somewhere mention if the cosine error correction changes in magnitude for high-albedo cases and by how much. And even if it does not change, that should also be mentioned as it is useful information.
- The cosine error correction may not be important for all the measurements made by the Brewer. It certainly is important for UV-doses. But does it matter for ozone (using irradiance under cloudy conditions) and aerosol estimates? Please discuss in the manuscript when the cosine error correction should be included in the analysis and the magnitude of the error on retrieved quantities.
- **Page 1, line 11:** It is not clear what is meant by “diminished even by”. Please rephrase this sentence.
- **Page 2, lines 4-5:** “The cosine error is typically between 5-15%”. Please specify if there is any wavelength dependence. Also, please mention possible reasons why the cosine error varies this much.
- **Page 2, line 32:** “modifications on” should be “modifications to”.
- **Page 2, line 32:** Fix “anscillary” typo.
- **Page 3, line 1:** Here you use band in a completely different (and unusual) way compared to page 2, line 20 (broad-band). Please use a different word than band here.

- **Page 3, lines 25:** Looking at figure 1 the slit functions differ by orders of magnitude outside the central region. Thus they are from being “very similar”. I would rephrase this sentence, mentioning that the slit functions are similar in the central region, outside they differ and this is due to the difference in stray light rejection by single and double Brewers.
- **Page 3, lines 26:** Please specify the units of the values 0.5 and 0.68. I presume it is nm?
- **Page 4, last line, page 5, line 1:** A coverage factor of 2 is the same as a confidence interval of 95%. There is no need to repeat this in the same sentence. Remove one or the other of this information.
- **Page 5, line 2:** I do not understand what is meant by the sentence “For measurements from 2002 to 2004 the expanded relative uncertainty was 4.6%” and why it is relevant here? And where does the number 4.6 come from, why is it different from the number 3.1 in the line above?
- **Page 5, line 5:** Change “constant to” to “constant at”.
- **Page 5, line 11:** What is meant by “previous dark laboratory”? You have built a new one for this study?
- **Page 6, line 2:** Typo: “Insitute”
- **Page 6, lines 3:** For a better read maybe change “response of the Brewers of AEMET were” to “responses of the AEMET’s Brewers were”.
- **Page 6, line 9:** Upon inspection of figure 3b it seems that 70° is a more correct number than 60° ?
- **Page 8, line 15:** How do you know the albedo?
- **Page 9, line 4:** Did you run DISORT in plane-parallel or pseudo-spherical geometry? If you used plane-parallel geometry your results for large solar zenith angles may be off.
- **Page 9, lines 4-5:** Please include references for the ATLAS3 spectrum, the DISORT code and the U.S. standard atmosphere.
- **Page 9, line 11:** Should *lambda* be λ ?
- **Page 9, line 11:** Where does the numbers 26 and 1250 come from?
- **Page 10, lines 20:** Typo: “triagnular”
- **Page 10, line 32:** Maybe change “protocol than” to “protocol as”.
- **Page 11, line 1:** Typo: “performred”
- **Page 14, line 12:** What is meant by “errors of even”?
- **Page 17, Figure 8:** It might be of interest to include plots showing how the retrieved cloud optical depths changes during the day.

- **Page 22, lines 5-8:** Should albedo also be included in the list of parameters that are needed? The albedo is included in the look up tables and it is surprising that it is not mentioned here. If it is not needed then it is not considered to be important and this has to be justified somewhere in the manuscript.