

Interactive comment on “Bipolar long-term high temporal resolution broadband measurement system for incoming and outgoing solar UV radiation, and snow UV albedo, at Sodankylä (67°N) and Marambio (64°S)” by O. Meinander et al.

Anonymous Referee #3

Received and published: 8 March 2016

General comments

The manuscript by Meinander et al. describes a system for the measurement of incoming and outgoing solar broadband UV radiation at two polar sites, i.e. Sodankylä and Marambio. After a general introduction, the measurement sites, the working principles, the data collection system, the calibration and the biggest challenges in such measurements are illustrated. Starting from Sect. 3, the authors list the major findings already reported in their previous publications.

Although the paper addresses very relevant scientific questions, its declared focus is

C1

“not to publish the existing data nor their scientific analysis”, as the authors themselves acknowledge, and the manuscript does not present any new finding. Sections 1, 2.1.1, 2.2, 2.4, 2.5 and most of Sect. 3 are fundamentally quoted from Meinander et al., 2008; the rest of Sect. 3 and Sect. 4.1 are taken from Meinander et al., 2009, 2013 and 2014, respectively. The only new addition to the present manuscript is the description of the Antarctic Marambio Base and its instrument (which is, however, similar to the one employed in Sodankylä and already described by Meinander et al., 2008 in detail).

Honestly, I cannot find any reason to publish the manuscript in GI, unless relevant new findings are added to the text. In that case, Sects. 3-4 could be summarised to compose a sound introduction of a substantially new paper. The manuscript cannot even be considered, in my opinion, a complete literature review on snow UV albedo, since most of the cited references in the second part of the text only belong to the authors.

Specific comments

The authors list the main “challenges” of the bipolar UV radiation measurements, but they do not provide an adequate quantification of the resulting overall measurement uncertainty in UV albedo estimates. How large do they expect it to be? Do this kind of measurements still make sense even in presence of large uncertainties?

I. 70: “this is our first paper to consider the Sodankylä incoming irradiance as an independent data set”. Please, explain how this is accomplished in the manuscript. Also, does this mean that no incoming UV irradiance measurements have been previously performed in Sodankylä?

Technical corrections

I. 23: “OC/BC”: please, define acronyms when used for the first time

I. 28: “Global Atmosphere Watch (GAW)”

I. 29: “World Meteorological Organization (WMO)”

C2

- l. 31: "International Polar Year (IPY) 2007-2008"
- l. 39-43: at least one citation is needed here
- l. 53-54: define the "RT" acronym. This sentence is also quite confusing to the reader, since the quantity employed in radiative transfer models is effective albedo, not local albedo. Please, explain how the two quantities are related to each other
- l. 126: add full stop at the end of the sentence
- l. 135: the SL501 erythemal irradiance is not "calculated" as a spectral integral, since broadband instruments cannot measure a spectrum and convolve it to an action spectrum. Rather, the measurement "represents" the convolution of the solar irradiance spectrum to the spectral response function of the instrument
- l. 144: why "spectral"?
- l. 151: is it essential to always specify "linux-computer"?
- l. 154-160: please, describe only the differences between both systems, do not repeat the common characteristics
- l. 176: are the sensors only "temperature controlled" or also "temperature stabilized"?
- l. 182: "some data": please, explain what kind of data needed to be excluded
- l. 187: could you explain how you cope with the problem of tree shadows?
- l. 212: "independent data of incoming and outgoing UV radiation": what do the authors mean by "independent"?
- l. 266: how is "c" defined?
- l. 308: "The Committee on Earth Observation Satellites (GEOS)"
- l. 330-331: does this consideration apply to both "polar regions" (l. 328)?

C3

Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss., doi:10.5194/gi-2015-31, 2016.

C4