Interactive comment on "Data flow of spectral UV measurements at Sodankylä and Jokioinen" *by* J. S. Mäkelä et al.

Anonymous Referee #1

Received and published: 1 February 2016

Review of the manuscript entitled: "Data flow of spectral UV measurements at Sodankylä and Jokioinen"

From my point of view the manuscript deals with the methodology that is followed by FMI scientists in order to measure, quality assure, post process and submit solar UV data related with two instruments that have been provided two of the longest UV data series worldwide. So the idea itself of reporting this methodology is worth publishing.

However, the paper itself does not particularly describe or properly reference all the methodology involved from the raw measurements till the final submission of the post processing data. It has structural problems and the link on the methods used – actual data and their presentation is weak.

Major comments

The English language used throughout the paper needs major improvements. There are various cases that words are missing or sentences are difficult to understand.

Introduction

Paragraph 1

"The Brewer was designed to measure ozone but then UV and now SO2 is measured". The correct way to write that, is that the instrument was initially designed to measured total column ozone with the differential absorption method (reference) using the direct sun port. In addition, the global (diffuser) port was introduced for measurements of spectral UV. Then the use of the direct sun data have used in order to calculate SO2 (reference), Aerosol Optical depth (e.g. Groebner, Kazadzis, Marenco ..), NO2 (e.g. Cede, Diemoz,..)

Paragraph 2

It is interesting to describe this dynamic range and in addition some details about the difficulty for such measurements for places like e.g. Sodankyla where low solar elevations is challenging for UV measurements.

Paragraph 3

It is interesting to mention a recent intercomparison campaign. But these results are not yet published. So in addition to this you could add results of a large number of previous publications that report such differences. (for example the SUSPEN paper by A. Bais and various others also in form of EU publications related with the QASUME travelling standard). In addition, describing this recent campaign someone has to clarify if this 20% down to 6% calibration differences are due to: primary calibration sources differences and processing differences or (/and) changes in the instruments due to their travel to the campaign site.

Last paragraph of the introduction

You are mentioning steps like: acquisition, processing, storage, and dissemination. I think that a proper way to describe all these steps is to start from :

a. Acquisition and Quality control of raw or e.g. level 0 data.

b. Calibration of the measured data

c. Quality control and corrections (spikes, straylight, dead time, etc) towards e.g. level 1 data.

d. Online real time checks

e. Post processing of spectral data and creation of e.g. level 2 or metadata.

I will get back to this point in the following sections

Section 2

It would be useful to provide some graphical example of the data availability from the beginning of the measurements till today. Also a simple graph showing the calibration record (e.g. instrument responses) for all the period, accompanied with the calibration uncertainties that can be probably differ from the early 90s till today.

I think that 3 pictures of the brewer locations can be only two, one from Sodankyla and one from Jokioinen.

Section 3

In order to make all the individual steps clear, I would stick to a format similar than the one described in the end of my comments for paragraph 1. It is important to make the individual steps very clear as this is all that the paper is about.

A table with the initial steps is essential. But more essential is to accompany this table with the references describe each of the steps. (e.g. figure 6 could be modified towards this goal) Figure 5 . Instead of providing a print screen image here. You can show internal lamp time series and examples of good and bad measurements and

corrections

3.3. Some acronyms are not defined

It is not clear if the IDEAS software is applied in the raw data or in the calibrate & corrected ones. I think you have to report that the software assures of specific "bad data" or instrument failures and not an evaluation of the post correction or calibration methods that are applied.

Instead of screenshots of "possible warnings" for describing the QA/QC you have to report on all warnings that are included in the process.

Section 4

I do not understand why "if necessary a wavelength correction is made." How do you know that is necessary or not if you do not already have a report on possible wavelength shifts ?

Personal remark

Copying from the manuscript:

"These instruments form an important network for monitoring changes in the total ozone column …. Nowadays, these spectral UV time series of over twenty years are unique and among the longest measured in the Arctic. "

and

"The observatory at Jokioinen is in the process of being shut down, and the spectral UV measurements have been moved to Helsinki. Thus, this paper also serves as a historical description of the Jokioinen measurements."

So Jokioinen is a "unique" and for sure among the longest not only in the arctic but worldwide, station for ozone and UV measurements but it is in the process of being shut down. Since this paper is co-authored and co-signed from 12 FMI scientists, I

want to pose the question: how it is possible to refer it here as a unique and historical station and at the same time to shut it down? And of course moving the instruments somewhere else is not an ideal way of a continuation of this 20 year series.

So for me it seems at least ironic to say that this paper is important (also) because Jokioinen is a unique station in terms of time series. Now, a paper that would show a full 20 year time series of Jokioinen Brewer measurements, calibration efforts, e.t.c. sure would serve as a historical description. On the other hand describing procedures for online quality control (only recently added) for a station that closes down are not useful for a future user of the data, as much as a report/publication on the actual calibrations, correction procedure, uncertainty analysis and measurement trend analysis for the particular station.

C5