

Based on the answer to the reviewers and the new document, I still have some major issues with major aspects of the used methodology and the interpretation of the results. I have got additional comments from one of the reviewers based on the new text and I have combined them with my comments that can be found below.

In long term series studies three major aspects have to be clear in order to ensure valuable results

- The data quality and the related uncertainty based on the quality assurance, quality control and calibration procedures that have been followed
- The methodology of treating/averaging/checking the datasets
- The interpretation of the results and the derived changes (here in UV) based on presented changes of the factors affecting UV.

More specific:

Abstract

I think that the included sentences such as: "All these changes are small and occur within a very variable signal." Plus the fact that is difficult to determine e.g. 1% changes with instrumentation that is just "better than 10%" have to be included here.

The abstract could be much more clear I suggest deleting the whole section starting with the new RAF text on line 19 up to line 27 and just continue with the last paragraph of new text (plus the comment above).

83 UV data

What was answered in one reviewer about not having gaps in the UV data series have to be included when describing the UV data section. It is amazing 25 years of UV data without gaps. Is the spectroradiometer calibration performed on site ?

Reading the argument from lines 100-105 it shows that in the second half of the 25 year period the max drift there could have been is 20% (+10% to -10%). The uncertainty in the data for all weather conditions and across the complete time period should be provided.

Also, after annual calibration, was data corrected if a change in the instrument was seen, and if so how? By linear interpolation back to the previous calibration, or some other method, or was the calibration only corrected going forward?

107 Ozone data

Ozone data could be continuous but Dobson and Brewer monitoring schedule/data availability depends on solar zenith angle and mostly cloud conditions. So some details on these data will help the reader to understand the use of the time series.

141 cloud averaging

A use of a constant 3 hour/day averaging of cloud coverage for assessing their impact on daily solar UV changes includes the uncertainty related with the cloud changes in the remaining daytime. This should be mentioned. A more realistic solution would be to weight the cloud amount for every hour with the percentage of cloudless sky UV for the specific hour versus daily cloudless UV. However, as this requires a lot of additional work the introduced uncertainty can just be mentioned.

144 Statistics

There is something that I can not understand.. statistically. How is it possible in a time series with no gaps the Hooke results that are based on summing up all days for a year and then calculate yearly anomalies and trends to be different than averaging daily values for each month and then calculating monthly anomalies and then trends. My impression is that the sum of the monthly anomalies in a year has to match the yearly anomaly calculated by Hook for the same year (with very small differences due to the small differences of the number of days in a month).

Outliers

More information on objective algorithms on rejecting outliers from the analysis should be provided.

The new text (lines 213-216) is contrary to the objective of the paper. If looking for underlying reasons for a trend (ozone, cloud) then data that may be particularly high/low due to ozone or cloud should not be removed from the dataset. They can be removed if instrument problems have been identified. Otherwise the outliers seem arbitrary, and how can data be an outlier one year when it is well within the whisker value for another year?

Ozone and UV seasonal trends

For the second period where clouds are almost constant and ozone plays the only role in the UV trends: the same amount of ozone changes has different effect in the UV for different seasons due to the differences in the related air masses. More specific constant ozone trends during all seasons would theoretically lead to higher UV trends in winter than in the

summer months (in percent). From tables 2 and 3 seems that the opposite was found. Is there any explanation for this ?

Aerosols

The atmospheric related reasons for UV changes can be clouds, ozone, aerosol optical depth, other aerosol optical parameters, albedo, other traces gases, ... (more or less ranked here based on their importance) changes. So if there are no data other than clouds and ozone you have to clarify it.

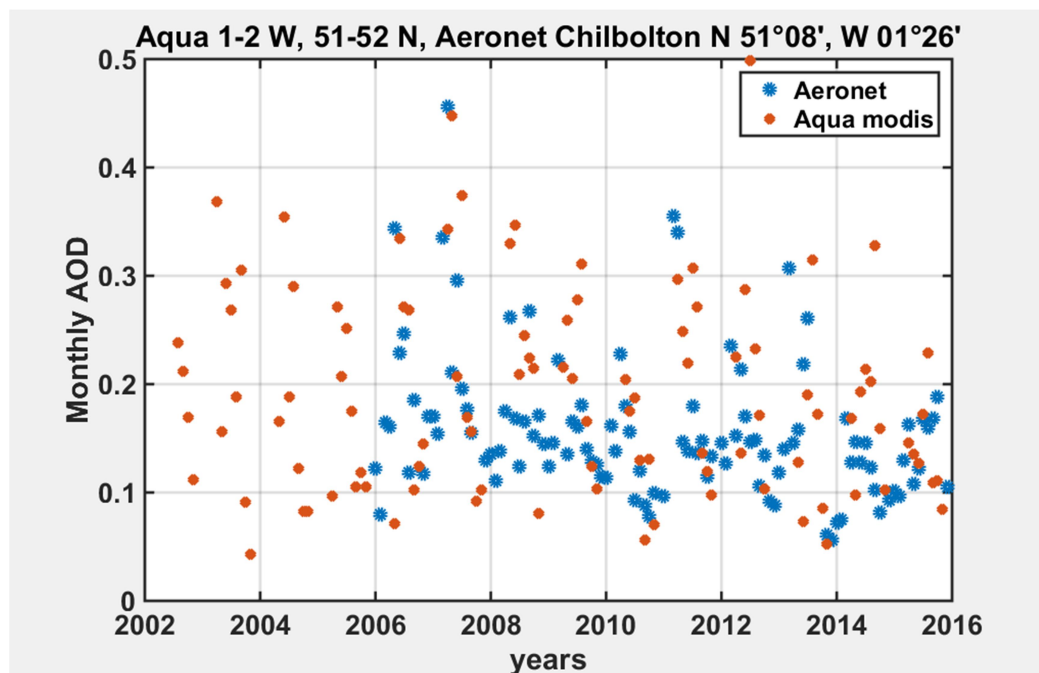
For the case of aerosols Zerefos et al., 2012 as you mention, presented changes also in non urban areas. I think that Aeronet/Chilbolton data and satellite data can be used in order to provide a hint on current speculations about a negligible 25 year effect of aerosols on this time series.

I could fast download 1 by 1 degree data around Chilton from MODIS Aqua shown below.

In addition Aeronet level 1.5 from Chilbolton station.

Modis/Aqua shows an AOD decreasing trend in the order of ~ -0.003 or $\sim -1.5\%$ per year. And Aeronet ~ -0.007 or $\sim 3\%$ change per year.

This figure is a bit rough in terms of spatial resolution for Modis/Aqua and the data have been just plotted as they are with no checks at all. But some work on this aspect (e.g. lower spatial resolution Modis data or just use of the Aeronet data) can provide some more insights on the aerosol issue for the second period. Aeronet 1.5 level data also I just plotted the NASA site existing monthly mean data. They represent Chilbolton station/area.



If you end up on similar results then more or less results for this period agree with Zerefos et al., 2012 that state that there is a turning point that (for constant cloudiness) that the ozone increase masks the aerosol (slower rate than before) decrease for mid-latitudes.

figures

The quality of the figure 3b in the paper is not good it needs some improvement on the submitted figure format.

I would suggest to move some of the sections describing previous works related with UV vs clouds, ozone, aerosols in the introduction section and summarize the agreement/disagreement etc findings of your work compared with the mentioned publications in the last section.

One of the native English speakers on the author list should go through the new version of the manuscript and correct the grammar – particularly, but not limited to, the new text.