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Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "Improved sky imaging for studies of enhanced UV irradiance" *by* J. M. Sabburg and C. N. Long

**J. M. Sabburg and C. N. Long**

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The authors thank Anonymous Referee #2 for their valued comments and we reply to each below:

General Comments:

Fully agree, especially using the wording, "I believe that this difference in scan time is contributing to the differences found in comparing results to earlier work."

Specific Comments:

1. "Uniformity" is outlined in section 2.3. Although it is mentioned in section 3.3 "77% of the enhanced scans were classified as non-uniform, based on the "Uniform" algorithm" we agree that we could elaborate further on this.

2. The ozone range of 248-311 DU corresponds to a possible change in UVI of +/- 15%.



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The +/- 9% instrument uncertainty is in addition to the +/- 9% variation of the clear sky-data. Thus the maximum uncertainty of +/- 18% exceeds the possible variation of the +/- 15% UVI.

3. Yes, the maximum enhancement stood out from the rest of the data and what we expected from previous research. In section 3.3 we state “Approximately 65% contained more than 50% total cloud cover” Wording can be changed to further clarify this as well as emphasis that this is preliminary data (5 months) and further work will justify plotting enhancement versus cloud cover.

4. Thanks and we agree. With this information provided we can now understand more fully what has been pointed out, after going back over the papers concerned. We will change the relevant sections to wording that reflects your suggestions.

5. Once again we agree. This information was not totally obvious to us and we will change the relevant sections to reflect this new understanding of the various papers mentioned.

6. We agree in principle and did mention as such in section 3.4, “Additionally, careful inspection of the before and after images in Fig. 5 (the visibility of the sun), suggests that the downward ‘trend’ of UV intensity with wavelength might correspond with a decrease in solar brightness during the end of a scan, Fig. 5b.” We can change the wording to emphasis that it appears that this may be the primary reason for the downward trend data, but we believe that we cannot rule out some effect, although may not be considerable, from dimming on the upward trend data at this stage. We conclude, “further study needs to include higher temporal resolution sky image capture and analysis to better document the variability during the scans. In addition an independent check of the obstruction of the solar disk by cloud and haze during a UV scan, particularly at larger SZA, is necessary to rule out any manifestation of the measuring process causing the ‘trends’. “

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 6213, 2004.



**ACPD**

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Interactive Comment



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