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Comment

Interactive comment on “Photolysis frequency measurement techniques: results of a comparison within the ACCENT project” by B. Bohn et al.

Anonymous Referee #2

Received and published: 9 June 2008

This paper describes the results of a comparison of various methods of estimating photolysis frequencies for ozone, nitrogen dioxide and formaldehyde at the surface over several days. The various techniques are described and compared in a variety of ways with the reference measurement. Reasons for deviations from the reference are presented. The paper is well-written and presents an important contribution for those using these instruments in their field measurement programs. The English is good, and while there are several figures, they are all needed to present the results of this study. This reviewer has only a few minor comments that the authors may wish to consider in preparing their final version.

Specific comments:

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Page 2, line 16. Suggest “elevation” rather than “altitude”.

Page 2, line 26. Suggest “controlled” rather than “determined”.

Page 3, line 49. Suggest “...proceed in the wavelength range...”

Page 3, line 56. Other field measurement studies have pointed to errors in molecular parameters, even though they can only be quantified through laboratory studies.

Page 3, lines 57-59. Suggest rewording this sentence or perhaps breaking into two sentences to make the points clearer.

Page 3, lines 66-67. Suggest adding a reference to the statement that 1 nm resolution is sufficient. Doesn't it depend on the desired accuracy and the wavelength region?

Page 5, line 134. Suggest “These two groups had their own irradiance... ”

Page 5, line 138. Suggest “The reference instrument will be described in more detail than the others. ”

Page 6, line 142. Suggest adding “diameter” to all the statements describing the dimensions of the shadow rings.

Page 6, line 148. Suggest “ ...remained stable to 2%, independent...”

Page 6, line 153. Suggest “ ...the double-monochromator to about ± 1 K. ”

Page 6, line 155. Suggest “Total measurement times for spectra including background determinations were about 110 s. ”

Page 6, line 167. Suggest “Clearly these factors were... ”

Page 6, line 175. Suggest “ ...5-7% based on the accuracy... ”

Page 7, line 196. Suggest “A scanning range of 250-600 nm and a FWHM of 1 nm was used. ”

Page 8, line 214. Suggest adding the total uncertainty at this end of this section. Also

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include for other techniques.

Page 8, .line 234. Suggest “ ...were obtained by measuring emission lines from low pressure mercury lamps. ”

Page 10, line 289. Suggest “ ...during the campaign period are plotted. ”

Page 10, lines 294-5. Suggest “ clear-sky data observed on 12 June 2006 are plotted... ”

Page 10, line 312-313. Suggest “ For the analysis of all spectroradiometer data, common absorption cross sections and quantum yields from the literature were used. ”

Page 11, line 324. Suggest “Alternative (method 2), the experimental... ”

Page 11, line 343. Suggest “ ...were expected due to spectra resolution... ”

Page 12, line 364. Suggest “This scatter appears random, but... ”

Page 15, lines 464-5. Suggest “For $j(NO_2)$, agreement within 1% was obtained. Slightly larger deviations ... ”

Page 15, line 473. Suggest “ ...could clarify the cause of these systematic ... ”

Page 15, line 477. Make the spelling of “analog” uniform throughout the paper.

Page 16, line 493. Suggest “ ...with the product of $\sigma\phi$ for NO_2 photolysis.”

Page 16, line 496. Suggest “ ...the opposite behavior remains unclear. ”

Page 16, line 517. Suggest “The $j(O^1D)$ -FR measurements also provide continuous... ”

Page 16, line 521. Suggest “ ...data analysis is more complex because there is normally... ”

Page 16, line 524. Suggest “ To compensate for this, output... ”

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Page 17, lines 531-2. Suggest “ ...reference data, linear regressions were performed which resulted in scaling factors to... ”

Page 17,line 533. Suggest “ ...varied in the range 0.98-1.23 and are listed in... ”

Page 17 throughout. Often past tense is used when present tense is correct.

Overall this is a very nice paper and should be published.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 10301, 2008.

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