Atmos. Meas. Tech. Discuss., 6, C3074–C3077, 2013
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Atmospheric Measurement Techniques Discussions

Interactive comment on "High spectral resolution ozone absorption cross-sections – Part 1: Measurements, data analysis and comparison with previous measurements around 293 K" *by* V. Gorshelev et al.

Anonymous Referee #2

Received and published: 26 October 2013

General

This paper describes a new laboratory data set of ozone cross-sections from the UV to the NIR, and compares this data set to other published data sets. Accurate laboratory measurements of ozone cross-sections at atmospheric temperatures are essential for satellite retrievals and determining long-term trends in ozone. This paper is useful, since it provides new measurements, and thoroughly compares and evaluates much used ozone cross-section data sets.

The paper is well-written. The reasons for making broad-band, high resolution ozone cross-section measurements at many temperatures are clearly given. The procedure for determining the absolute calibration is well described. The error analysis is clear.

The paper can be accepted after some smaller corrections.

Specific comments

What is missing in the introduction is the unique need for the measurements of this paper. There are already many ozone cross-section data sets. It seems that the BMD measurements can be used as well.

Suggestion: divide section 2.1 - which is quite long - in two parts: the first about the experimental conditions, especially the absolute calibration of the ozone amount, the second about the spectrometry.

Textual points

Please check the English, since often the article (the, a) is missing.

Please spell echelle with a small e, since it is a type of instrument and not a person's name.

p. 6568, l. 20: depletion > depleting
p. 6570, l. 12: Komhyr and Evans: give year
p. 6571, l. 3: FM21 > FM2 ?
p. 6572, l. 2: IR > NIR
p. 6572, l. 18: values in UV . . . > in the UV . . .
p. 6574, l. 8: of ozone molecules
p. 6574, l. 16: This way > In this way
p. 6575, l. 5: scans > spectral scans
p. 6575, l. 7: thereby > whereby ?
p. 6576, l. 19: FT spectrometer > FTS (this occurs at more places)
p. 6576, l. 26/27: . . . , i.e. the full width at half maximum (FWHM), . . .

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p. 6577, l. 3: Boxcar > boxcar
p. 6577, l. 11: spectra > spectral
p. 6578, l. 8: consequent > subsequent ?
p. 6578, l. 24: spectra pieces? Please reformulate
p. 6579, l. 3-6: please reformulate this long sentence
p. 6579, l. 20: 200 > 2003
p. 6584, l. 9: in 1998 > and 1998
p. 6585, l. 6/7: region differences? Please clarify
p. 6587, l. 15: Satellites > Satellite
p. 6589, l. 4: W): missing text?
p. 6591, l. 17: data set > data sets aa

References:

The refereed paper reference for the OMI DOAS total ozone product is Veefkind et al., IEEE TGRS, vol. 44, no. 5, May 2006. However, there the BP cross-sections are used.

Please check the AMTD 2012 references (Bhartia et al., Chehade et al.) if they should be AMT.

Grebenshikov: journal name seems incorrect

Petersen: please check title

Rothman: please correct the journal name JQSRT

Tables:

Table 3: header: limits, nm: shift to second column.
First Burrows, then Bogumil, like in the other tables.
Caption: please explain the scaling factor.

Table 6: caption: remove “and IR” since these are visible wavelengths.

Figures:

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In general, the decimal comma used in the figures should be a decimal point.

Fig. 2: caption: infrared > near-infrared

Fig. 4: top plot: This work: 293 K

Fig. 5: bottom panel: was scaling and wavelength shift applied in the comparison with Bogumil?

Fig. 6: caption: how is the relative difference defined? “ratio to . . .” is not equal to a relative difference.

Fig. 8b: this work: add 293 K

Interactive comment on Atmos. Meas. Tech. Discuss., 6, 6567, 2013.