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Atmospheric Chemistry and Physics Discussions

Interactive comment on "SO_2 Retrieval from SCIAMACHY using the Weighting Function DOAS (WFDOAS) Technique: comparison with Standard DOAS retrieval" *by* C. Lee et al.

Anonymous Referee #2

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General Comments:

Sulfur Dioxide (SO2) is an important trace species in the atmosphere, both under background conditions and in polluted areas. It plays an important role in atmospheric chemistry, and is released to the troposphere as a result of both anthropogenic and natural phenomena. Satellite remote sensing is a powerful tool, particularly to monitor volcanic SO2, which occurs often in uninhabited/ inaccessible regions. This manuscript is a nice piece of work. As SO2 retrieval in UV range is complicated by several factors and authors tried to resolved them some how successfully. Especially, the problems experienced in standard DOAS approach are tried to overcome by using a new ap-

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proach WFDOAS for SO2 retrievals. However, there are some important points given in 'specific comments' section should be addresses/justified before publishing this article.

Specific Comments:

1- Page 10820, line 17-21, claims low SO2 over elevated regions. But according to Khokhar et al.[2005], Over high regions e.g. Himalaya and Andes etc. experienced High SO2 (an artifact) and was eliminated by ratio spectrum method. There is need to consult [Khokhar et al, 2005] carefully.

2- Figure 2 seems to be incomplete as it is only a comparison of WFDOAS approach with two different scenarios of using ORSC and single ring spectrum, while in text, it is claimed to be inter-comparison of SDOAS and WFDAOS approaches. Either text (see page 10826) should be modified or results of SDOAS should be included in Fig.2.

3- Figure 3 is misleading, as mentioned in the text and caption of Fig 3, it is stated that SCIAMACHY spectra are taken from orbit no 24868 on December 2006 between 80°W-120°W, which is not true, as this orbit is not over the region according to given coordinates (for further detail see http://atmos.caf.dlr.de/projects/scops/). There is need to correct it.

4- Fig.4; panel 4 having title 'SDOAS SCIA diff.', authors did not mention neither in text nor in caption, which difference is that, either with SDOAS or BRD OMI data

5- There is need to reformulate Table 1 in an easier and fascinating way rather using a lot of footnotes.

6- Authors claim for resolving experienced difficulties in standard DOAS method but did not discuss about the error analysis. It will be nice if few sentences are added about improvements in systematic and fit errors. Even an overall rough estimate of error improvement will be sufficient.

7- References section needs to be revised carefully

ACPD

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Interactive Comment

Reference:

Khokhar, M. F., C. Frankenberg, M. Van Roozendael, S. Beirle, S. Kühl, A. Richter, U. Platt and T. Wagner, Satellite Observations of Atmospheric SO2 from Volcanic Eruptions during the Time Period of 1996 to 2002, Adv. Space Res. 36, 879-887, 2005.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 10817, 2008.