

## ***Interactive comment on “SO<sub>2</sub> Retrieval from SCIAMACHY using the Weighting Function DOAS (WFDOAS) Technique: comparison with Standard DOAS retrieval” by C. Lee et al.***

**C. Lee et al.**

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Response to Specific Comments

1- Page 10820, line 17-21:

Over elevated areas, the SO<sub>2</sub> column is smaller and after offset correction often negative in our SDOAS retrieval. These could be related with interference from Ring effect but clear no clear conclusion has been drawn so far. The reference 'Khokhar et al.' 2005' has been removed in the paragraph.

2- Figure 2:

Figure 2 and Figure (a) comes from SCIAMACHY data of the same orbit, and results

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of SDOAS are shown in Figure3. So, the reference to Figure 3 has been added at the end of sentence (line 11): "These offsets decrease slightly at higher latitudes, while they are decreasing and even reaching negative values at high latitudes in the SDOAS retrievals (see Figure 3 (a)).".

### 3- Figure 3:

The descriptions of region of orbit no. 24868 have changed to "20°W &#8211; 30°E" in the text and the caption of Figure 3.

### 4- Fig.4:

The 'diff' in Figure 4 means the difference between slant columns and the columns over reference sector.

The titles of each panel of Figure 4 have changed to "WFDOAS SCIA: 01-31 DEC 2006", "SDOAS SCIA: 01-31 DEC 2006", "BRD OMI: 01-07 DEC 2006", and "SDOAS SCIA RSM-Corrected: 01-31 DEC 2006". The caption have been revised: "Figure 4. Global maps of SO<sub>2</sub> slant columns averaged over December 2006. The panels show SO<sub>2</sub> slant columns from the WFDOAS retrieval (top left), the SDOAS retrieval (top right), the RSM-corrected SDOAS retrieval (bottom right), and the OMI BRD algorithm (bottom left). In the area of the Southern Atlantic Anomaly (SAA), large scatter in WFDOAS and SDOAS SCIAMACHY SO<sub>2</sub> results from exposure of the instrument to radiation and particles. RSM: Reference sector method (Martin et al., 2002; Richter and Burrows, 2002). There are the open areas in WFDOAS retrievals due to no SACURA data and in the BRD OMI retrievals due to cloud-screening.".

### 5-Table 1:

Table 1 has been reformulated in the revised manuscript.

### 6-:

In the revised manuscript, "Slant column fitting errors (about 100 - 200% relative errors)

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in WFDOAS retrieval are at level similar to those in SDOAS retrievals and could be associated with the intrinsic measurement noise of SCIAMACHY. The fitting errors are related with low radiances measured by SCIAMACHY at shorter wavelengths and high solar zenith angle (or high ozone). The measurement of low radiances leads to the uncertainties in SO<sub>2</sub> retrievals." has been added in section of Conclusions.

#### 7- References:

References section has been checked. Lamsal et al. (2007), which is not cited in the text, has been removed from reference list. The following references, which are cited in the text, have been added into reference list: "Chance, K.: Analysis of BrO Measurements from the Global Ozone Monitoring Experiment, Geophys. Res. Lett., 25, 3335-3338, 1998.", "Richter, A., Burrows, J. P.: Tropospheric NO<sub>2</sub> from GOME measurements, Adv. Space Res., 29, 1673-1683, 2002.".

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