**Atmospheric
Measurement
Techniques
Discussions**

Interactive
Comment

Interactive comment on "Retrieval of SO$_2$ from thermal infrared satellite measurements: correction procedures for the effects of volcanic ash" *by* S. Corradini et al.

Anonymous Referee #2

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General comments: Compares 2 methods for correcting the influence of ash in the volcanic SO2 retrieval for SEVIRI and MODIS to other retrieval results from MODIS and AIRS. Demonstrates the importance of this correction and conditions where the higher accuracy/slower algorithm is required.

My only substantial question is regarding the AIRS SO2 retrieval. The authors need to describe this in more detail. Does the AIRS retrieval combine the radiances in the 7.3 μm band or does it use spectrally resolved information? If the latter case, I would expect AIRS to be closer to the corrected value in table 2 since it can distinguish SO2 spectral features from ash absorption.

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The authors should also explain that AIRS has a spectral gap from 8.22 to 8.81 μm and therefore a comparison of SO2 for 8.7 μm is not possible.

Specific comments & wording suggestions:

p. 2 Abstract, 2nd paragraph: change: The results show the importance of the ash correction on SO2 retrieval at 8.7 μm – the SO2 columnar abundance corrected by the ash influence is less than one half of the values retrieved without the correction.

To: "The results show the importance of the ash correction on SO2 retrievals at 8.7 μm, where the corrected SO2 column abundance values are less than 50% of the uncorrected values."

p. 5 Section 2, Motivation of the work, 1st paragraph:

This has your first mention of AOT – should be defined here since it is used later without definition (aerosol optical thickness)

p. 14 sec. 6.2.1 1st paragraph:

change: The main reasons for these differences are that the ash influence is stronger on the 8.7 μm channel compared with the 7.3 μm channel (see Sect. 2). The ash absorption that leads to the SO2 retrieval overestimation is stronger at 8.7 μm than at 7.3 μm.

To: "The main reason for these differences is that the ash influence is stronger on the 8.7 μm channel compared to the 7.3 μm channel (see Sect. 2), which leads to a larger SO2 retrieval overestimation at 8.7 μm than at 7.3 μm."

Tables:

Combine Table 1 and Table 2 and add AIRS value.

Figures: Figure 2. As mentioned previously, AOT not defined

Figure 8. Show a zoomed plot as well to see plume structure.

Interactive comment on Atmos. Meas. Tech. Discuss., 2, 303, 2009.

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