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Interactive comment on "SCIAMACHY Absorbing Aerosol Index – calibration issues and global results from 2002–2004" *by* M. de Graaf and P. Stammes

M. de Graaf and P. Stammes

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General comments

The referee is thanked for the careful review of the manuscript. Below all points raised by the referee are discussed. Some of the issues were also raised by referee #1. For additional information on these issues the reader is referred to the answers to comments of referee 1.

Answers to specific comments of referee #2

P3368, L5, P3370, L10-15, L12 The textual suggestions have been adopted.

P3372, L23-24, P3373, L16 The text was rewritten to infer the correct meaning.

P3379, L12

Unfortunately when using the AAI, a greater daily global coverage does create higher zonal means depending on the way that the averages are determined. Since the AAI is defined only for positive residues, perfectly legitimate measurements can be flagged as invalid when a residue smaller than zero is found. This is not a wrong measurement, but can be a cloudy scene. So an average can be increased when more pixels are found with high residues and decreased when more pixels are found with negative residues. In this way larger global coverage can also yield higher zonal means.

P3379, L12

The definition of the V8 TOMS in AAI has changed indeed. See the discussion in the answers to comments of referee 1 point P3379 L9-10, L14, L16. The results in Figure 6 were from V8, but a new figure was prepared to replace this, see again referee 1 comments.

p3379 L17 and further

In 2002 SCIAMACHY did not perform badly as also pointed out by referee 1, only the AAI results are not very satisfactory. This is because the data discussed in the manuscript were processed by several different versions of the processor and the amount of data in 2002 was very low (see Figure 2 of the manuscript).

p3380 L1

The operational AAI is not useless. The manuscript states that the LUTs can easily be updated using a radiative transfer model incorporating polarisation, and that this would make the operational AAI a useful product (p3380 L14), since the reflectance offset only creates a linear shift of the AAI. Indeed, with updated LUTs the operational product can be very useful, because the expected shift may decrease when the calibration of the data improves. And also data before 2004 are expected to be useful in that

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case, because all data are available for operational reprocessing. The amount of data presented in Figure 2 was the amount available at KNMI and used for the production of the scientific AAI. Reprocessing of the scientific AAI must be done manually and is unlikely.

p3380 L7

The term “fine tuning” has been removed. What was meant was that the correction factors are not entirely correct, but the result is only a small linear shift of the AAI (see the answers to comments of referee 1).

p3380 L26 The suggestion was adopted.

Figure 6

The referee suggests to change the scale of the plot. But plotting both curves on the same scale results in a flat curve for the SCIAMACHY AAI. However a new figure was created to replace Figure 6, see the answers to comments to referee 1.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 3367, 2005.