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Comment

## ***Interactive comment on “Improved stratospheric aerosol extinction profiles from SCIAMACHY: validation and sample results” by C. von Savigny et al.***

### **Anonymous Referee #2**

Received and published: 25 September 2015

This paper presents a brief description of the updated SCIAMACHY stratospheric aerosol extinction retrieval algorithm and demonstrates the quality of the resulting retrievals by comparison with the previous version and with the SAGE II version 6 and 7 aerosol extinction coefficient profiles. The new algorithm demonstrates substantial improvement, and the SAGE II comparisons highlight the overall agreement and specific regions with possible biases. The sample results section is excellent; it does a very good job of surveying highlights from previous studies with quantitative comparison to the SCIAMACHY results obtained here. This paper is very relevant to AMT and I recommend that it be published with the following suggestions for minor revisions:

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Abstract: The sentence beginning, “The results indicate that a series of volcanic eruptions is responsible. . .” suggests that this is an original claim. The wording should more appropriately be changed to something like, “The results confirm earlier reports that a series of volcanic eruptions is. . .”

8354, line 20: There is also a background size distribution from non-volcanic, natural and anthropogenic source gases.

8355, line 20: Please reference the work that first showed the effect of the minor tropical eruptions, i.e. Vernier et al., 2011

8358, line 10: It would be good to reference Bourassa et al., 2007, and the OSIRIS aerosol extinction data product, for the use of the 750 nm /470 nm spectral ratio in the algorithm.

8358, line 25: Can the authors include some results and discussion on the impact of using the Matthews (1983) climatological albedo? As the authors state later in Section 4.2, nearly all limb scatter measurements are affected to some degree by clouds below the relatively long line-of-sight, the effect of which would not be captured with climatological albedo. Why can the effective albedo not be retrieved at the normalization tangent altitude?

8361, lines 1-10: It would be beneficial to add a discussion on the possible systematic bias due to uncertainty in the assumed scattering phase function and how that relates to the solar scattering angles of the SCIAMACHY orbit.

8362, line 24: Why is the term “backscattering” used here? In fact, for the northern hemisphere, the SCIA observations are in a forward scatter geometry.

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Interactive comment on Atmos. Meas. Tech. Discuss., 8, 8353, 2015.

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