The authors present a revised version of the aerosol retrieval algorithm, improving the convergence of the iterative retrieval process and increasing the sensitivity to the aerosol signal, as well as a new normalization improving the robustness with respect to the measurement noise. Further, they introduce a simultaneous retrieval of the albedo in order to take into account correlations between this parameter and aerosol extinction. Finally, the retrieved aerosol extinction is validated using the SAGE III data set over the period 2002-2005.
The paper presents a very careful and complete analysis of all the aspects of this complex problem, as some convincing illustrations.

I would suggest several minor revisions and I would be happy to have the author's comments about some scientific issues for the following points:

- L. 7 p.25788: What is precisely 1 km at the tangent point?
- L. 4-5 p.25790: For the sake of clarity, the authors should precise which quantity corresponds to the denomination "measurement vector".
- L. 10-16 p.25790: Did the author check the sensitivity of the retrieval to the choice of particle size distribution (PSD) ? The choice of PSD is representative for background condition, which is a poor choice in some situations such as periods following a volcanic eruption (as mentioned later on).
- L. 17-18 p.25790: The authors define correctly x as the state parameter, but for the sake of clarity, they should mention which atmospheric parameter it represents.
- L. 24 p.25791: The role of the k index is not defined, and does not appear in the right-hand side of the equation. Do I understand well that there is no more normalization of the radiance in the first term of the right-hand side? Why did the authors remove this normalization?
- L. 9 p.25793: Same problem with index k as in L. 24 p.25791
- L. 8 p.25794: I suggest that the authors revise their sentence as "… that can be used to determine the offset…" for the sake of clarity (possible confusion with "that can be used for the retrieval itself").
- L. 27 p.25794-1 p.25795: Would it be possible that the result of the alternate iterative retrievals of the aerosol extinction profile and of the albedo depends on the initial guess, i.e. that the combination of both problems lead to a probability density function with several local maxima, able to be reached by a suitable choice of the initial guess ?
- L. 13-14 p.25795: Do I understand well that the authors mean "increased Rayleigh scattering" in this sentence ?
- L. 10-18 p.25795, also l. 16-18 p.25800: Do I understand well that this problem becomes more acute if the aerosol concentration (and hence the extinction) increases? And what would happen in the case of high volcanic load (let's suppose that the assumption on the particle size distribution is then adapted accordingly to the situation). In such a case, the displacement of the dominating aerosol mode toward coarse particles can induce a roughly constant of even positive spectral dependence of the extinction, instead of the decreasing dependence observed for background aerosols [cf. Brogniez et al. (1996), JGR, 101, 1541]. Would it be problematic for the aspect considered here? Are there

conclusions to be drawn about the applicability of the retrieval method in case of high volcanic load?

- L. 17 p.25795: Some explanation should be given on this “positivity constraint”, possibly when introducing the retrieval scheme on Eq. (2), or by just citing some reference where it is discussed.
- L. 3-5 p.25796: Could the authors give some idea about the improvement using the new retrieval vector in terms of number of iteration to get the convergence ?
- Fig 7: This figure is remarkable and shows the added value of a limb scattering instrument in detecting the local variation of the aerosol load in the stratosphere. However, in which extend can one consider the high extinction values as reliable in view of the assumption made on the particle size distribution ? (cf. remark on L. 10-18 p.25795)
- L. 10-11 p.25800: This sentence should be attached to the previous paragraph discussing the same case of 2005. Starting a new paragraph with it before talking about general considerations on validation without link with this sentence is a bit confusing.
- L. 5-7 p.25802: “The authors should add : “throughout the bulk of the stratospheric layer *in the conditions of low volcanic load encountered in 2002-2005*, …”.
- Residual spelling errors of badly constructed sentences are found, see l.25 p.25787 and l.4 p.25793.