This study developed a new iterative algorithm to retrieve aerosol extinction and effective radius profile from two-wavelength Mie scattering lidars. The method is justified using synthetic data and applied on CALIPSO measurements. Comparison with EARLINET Raman lidar results indicated improved performance. I recommend publication after addressing the following comments and questions.

Response: We thank the reviewer for his\her encouraging and valuable comments on our manuscript, and we have revised the manuscript according to his/her suggestion.

1. The authors only used Raman lidar measurements from 3 stations to validate the results. Why weren't more sites used?

Response: Thanks for this comment! We did try to collocate all the EARLINET data with CALIOP measurements, but only these three stations are best matched with CALIOP under the collocation and data quality critieria (e.g., clear sky).

2. The comparison between CALIPSO and Raman lidar profiles is too qualitative. Please add some quantitative evaluation. For example, how much is accuracy of extinction profiles improved by the new algorithm?

Response: Thanks for your advice! We have added quantitative evaluation with MAPE (Mean Absolute Percentage Error) in Lines 234-236 as following:

"*, and our algorithm reduces the mean MAPE between the retrieval of extinction profiles in CALIOP and Raman lidar from 74% (CALIOP operational product) to 37%.*"

3. Why do you need to "remodel" Raman lidar profiles?

Response: We are sorry for the confusin. Because CALIOP is a space borne lidar, we use forward integration to solve the lidar equation. In the application to ground-based Raman liadr measurements, because the boundary value of aerosol extinction at surface is very difficult to obtain, we remodel the original lidar signal to the downward attenuated backscatter by lidar equation with molecular & aerosol extinction coefficient and backscatter coefficient profiles obtained from Raman method (Tao et al., 2008), so that we can use the far end solution.

4. Lines 91-92: The depression "$T2(R)$ is the one-way transmittance from the lidar to the scattering volume at range R" may be a mistake. $T2(R)$ in lidar equation is the two-way transmittance.

Response: Thanks for this comment! We have revised the mistake accordingly.

5. Lines 98: The reference may be cited in a wrong format.

Response: Thanks for your advice! We have revised this reference.

6. Lines 179-183: How do you obtain the extinction and backscatter coefficient at $1064nm$ from Raman lidar? And what does the approximation of AE at 1064nm meaning?

Response: Thanks for this comment! The Raman inversion just can retrive extinction profiles at 355 nm and 532 nm, as well as backscatter profiles at 355 nm, 532 nm and 1064 nm. We approximate the *532 ~ 1064 nm AE as the the 355 ~ 532 nm AE* , and use Eq. (10) to calculate extinction profile at 1064 nm. We added the following explanation in Lines 188-189:

"*, that we approximate 532 ~ 1064 nm AE as the the 355 ~ 532 nm AE and calculate extinction profile at 1064 nm according to Eq. (10).*"

7. Lines 214-219: The observed atmospheric profile is used to calculate backscatter and extinction coefficient profiles of air molecules for CALIOP retrieval. But where does the observation data come from?

Response: Thanks for this comment! The CALIOP level 1B products include meterological data provided by MERRA-2.

References

Tao, Z., McCormick, M. P., and Wu, D.: A comparison method for spaceborne and ground-based lidar and its application to the CALIPSO lidar, Applied Physics B, 91, 639, 10.1007/s00340-008-3043-1, 2008.