

Atmos. Meas. Tech. Discuss., referee comment RC2  
<https://doi.org/10.5194/amt-2022-289-RC2>, 2022  
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## Comment on amt-2022-289

Anonymous Referee #2

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Referee comment on "The CALIPSO version 4.5 stratospheric aerosol subtyping algorithm" by Jason L. Tackett et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2022-289-RC2>, 2022

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Authors provide description of updated version of stratospheric aerosol subtyping algorithm (version 4.5) for CALIOP. They provide very detailed explanation of the reasons to revise the lidar ratios and the lidar ratios, as well as changes in algorithm structure. Updated algorithm is applied to numerous measurement cases, corresponding to ash, smoke and sulfate dominance and results are compared with previous version (V 4.2), demonstrating the difference. The manuscript is well and clearly written, thus is suitable for publishing in AMT. The results presented will be useful for scientific community studying the stratospheric aerosol.

Referee #1 provided detailed comments on manuscript and I have not much to add. But I am confused with choice of lidar ratio for smoke at 1064 nm (Table 2). The value of 30 sr that they suggest is very low by my opinion. There are several publications of Leipzig group

Depolarization and lidar ratios at 355, 532, and 1064 nm and microphysical properties of aged tropospheric and stratospheric Canadian wildfire smoke

Moritz **Haarig**, Albert Ansmann, Holger Baars, Cristófer Jimenez, Igor Veselovskii, Ronny Engelmann, and Dietrich Althausen

Atmos. Chem. Phys., 18, 11847–11861, <https://doi.org/10.5194/acp-18-11847-2018>, 2018

The lidar ratios there are 40–45 sr (355 nm), 65–80 sr (532 nm), and 80–95 sr (1064 nm) for Canadian smoke....

Australian wildfire smoke in the stratosphere: the decay phase in 2020/2021 and impact on ozone depletion

Kevin **Ohneiser**, Albert Ansmann, Bernd Kaifler, Alexandra Chudnovsky, Boris Barja, Daniel A. Knopf, Natalie Kaifler, Holger Baars, Patric Seifert, Diego Villanueva, Cristofer Jimenez, Martin Radenz, Ronny Engemann, Igor Veselovskii, and Félix Zamorano

Atmos. Chem. Phys., 22, 7417–7442, <https://doi.org/10.5194/acp-22-7417-2022>, 2022

Combined lidar–photometer retrievals revealed typical smoke extinction-to-backscatter ratios of  $69 \pm 19$  sr (at 355 nm),  $91 \pm 17$  sr (at 532 nm), and  $120 \pm 22$  sr (at 1064 nm) for Australian smoke.

I think this difference should be commented.