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 publication 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, Cristofer Jimenez, Igor Veselovskii, Ronny Engelmann, and Dietrich Althausen
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


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

I think this difference should be commented.