

Most of my comments have been well addressed, but there are still some unclear parts of the manuscript requiring revision. The structures and presentation quality of the Introduction, Algorithm and Data and Method parts still need to be improved. The details are as follows:

1. Previous Comment 7: It is still unclear that what the principle and process of DOAS fitting are. Do the authors mean fit the O<sub>2</sub>-O<sub>2</sub> SCD with GEMS observed radiance in the fitting window using polynomial function? What is the SCD error? What do none offset and 0th offset mean in Table 2?
2. Line 204: It is mentioned that "L2AERAOD results for AOD and SSA at 550 nm were adopted as input data for aerosol properties", but in Table 3, the refractive index at 440 nm is used in the LUT. How do the authors convert the wavelength dependent refractive index or SSA and AOD?
3. I suggest to move the descriptions about how to collocate GEMS and CALIOP or TROPOMI data into an independent subsection in Section 3.
4. Previous Comment 13: I don't think this comment is well addressed. 1) I don't understand why some collocated pixels are overlapped. Do the authors mean GEMS or CALIOP pixels? I think the normal way to collocate GEMS and CALIOP pixels is to use the averaged value of GEMS within pre-defined distance (such as 50 km used in this manuscript) or 10% closest pixels with the standard deviation as the error bar. Refer Chen et al., 2021. 2) Even though "retrieval around the 2 km AEH from CALIOP is not from single plume regions", why do the retrievals from GEMS differ so a lot?