Technical comments for a manuscript titled “A first comparison of TROPOMI aerosol layer height to CALIOP Data” by Nanda et al.

P2

2: UV absorbing index (UVAI) → should this be ‘UV aerosol index (UVAI)’?
This definition is mixed up throughout the texts. Please see below.

32: Should include Sentinel 4 in addition to

32: for GEMS products including aerosol layer height, there is a updated reference for your consideration, for balance with Zoogman et al. of TEMPO :

Kim, Jhoon et al. (2020), New Era of Air Quality Monitoring from Space: Geostationary Environment Monitoring Spectrometer (GEMS), *BAMS*, 101, 1, doi:10.1175/BAMS-D-18-0013.1.

34: there ar → there are

P4

2: ALH - acronym not defined in main body (defined in abstract only)

7: aerosol layer height → ALH

10: Section 2) → Section 2

12: 3 → Section 3

14: section 4 → Section 4

15: 1E4-1E7 → $1x10^4$ ~ $1x10^7$

20: DISAMAR - acronym not defined. Also need a reference

P5

13: Mie model – need a reference as authors did for Henyey and Greenstein (1941)

18: AERONET – need ref. with acronym definition

23, 24: mid pressure – it was referred as ‘centroid pressure’ in p3:26, if my understanding is correct. Need consistency in wording

P6

6. : UV Absorbing Index – is this different from UVAI, which is UV Aerosol Index in p4:27 ? This is confusing with the definition in p2:2. If not, please use ‘UVAI’ as defined earlier.

16: 1e-7 → $1x10^{-7}$

19: bitwise-and – do you need ‘-‘ here?

26: receive channel → receiver channels

28: aerosol layer heights → ALHs

P7

Table 1 caption: define IODD.

Solar zenith > 75 deg → Solar zenith angle > 75 deg

Acronyms used in the Table should be defined: e.g. DEM, STD ..

5: lidar → LIDAR throughout the manuscript

P8

10: that aren't cloud filtered → how about 'regardless of cloud filtering, '

14~18: → This sentence is too long to read and understand. Please consider to split into two sentences, one for land and the other for ocean.

31: AOT not defined

P9

13: differing → different or difference

22: 'UVAI' was defined earlier (but need to correct the confusion mentioned earlier)

24: height of aerosol layer → ALH

27: successful the retrievals → successful retrievals

31: species → particles? components?

P10

5: aerosol layer height → ALH

10: AOT was used earlier in p8. Should be defined where it was first used.

15: inspection of figures in Figure 5 → inspection of Figure 5

20: In case such as case c, → In case c,

26: aerosol layer height → ALH

P11

1: 21.50 deg → 21.5 deg

11~12: too many 'that' … expression which result in poor readability. Very confusing. Or, at least, how about the following sentence ?

Parts of the CALIOP curtain plots for cases a, b and c suggest the existence of a possible second layer beneath the layer that is visually obvious, or that the desert dust layer extends deeper to the surface and the CALIOP signal is simply too attenuated to detect it.

31~32: on average by approximately -1 km and -0.7 km median → meant 'by approximately – 1km on average and -0.7 km as median'?

P12

1: aerosol layer height → ALH

10: can to be → can be

17: seem to not be → do not seem to be
23: aerosol layer height → ALH
24: are a very good source → is a very good source

P13
1: scipy.spatial.KDtree module → need reference
5: co-locations → need consistency in manuscript, either ‘colocations’ or ‘co-locations’
16: ‘SSA’ is proportional to scattering, not absorption. ‘Co-albedo’ is more appropriate (Co-albedo = 1-SSA)
16: AOD → AOT has been used throughout the manuscript. Need consistency.
21: aerosol optical depth → AOD with acronym definition, but need consistency between AOT and AOD.