Responses to Editor:

1. Line 18. This statement implies that the Absorbing Aerosol Index (AAI) detects aerosols beneath clouds. That is incorrect. The AAI can detect UV-absorbing aerosols mixed with clouds but not beneath clouds. The AAI also detects UV-absorbing aerosols above bright backgrounds such as snow/ ice covered surfaces, or above cloud decks. This is amply documented in the literature [Herman et al., 1997; Torres et al., 1998].

Response: Thanks for your suggestion. We revised this sentence to: but also compensates for the shortcomings of other products that cannot detect UV-absorbing aerosols mixed with clouds.

2. Line 62. Provide references for the UV-absorption technique that has been applied to multiple sensors: TOMS (on Nimbus-7 and Earth Probe platforms, Torres et al 2002), andcurrently applied to OMI on Aura platform (Torres et al., 2007), EPIC on DSCOVR satellite (Ahn et al, 21), and TROPOMI on Sentinel5-P (Torres et al., 2020). There are many instances or unresolved acronyms such as TOMS (Total Ozone Mapping Spectrometer) and others.

Response: Thanks. In this section, we added the corresponding references.

3. Line 68. Add reference for the NASA TROPOMI aerosol product (Torres et al., 2020).

Response: Thanks. We have added the references.

4. Line 76. The earliest analysis of this type was carried out by Prospero et al (2002) based on TOMS data.

Response: Thanks. In the article, we added this reference.

5. Line 196. Be consistent in the naming of the sub-sections 2.2.1 through 2.2.4. Currently 2.2.1 refers to satellite, 2.2.2 to the sensor, while2.2.3 and 2.2.4 refer again to the satellite. Isuggest using hyphenated sensor-satellites such as MODIS-TERRA/AQUA, TROPOMI/S5P, etc.

Response: Thanks for your suggestion. We have modified the corresponding titles.

6. Line 216. Clarify that the UVAI method that detects aerosol mixed with clouds and above cloud-layers is only a qualitative measurement. In the last twenty years, however, accurate approaches to derive quantitative information such as aerosol optical depth and single scattering albedo of smoke and dust aerosols for cloud-free conditions (Torres et al, 2002, 2007; Ahn et al, 2021) and above clouds from

UV (Torres et al., 2012) and visible observations (Jethva et al., 2013) have been developed.

Response: Thanks for your suggestion. We revised this sentence to: Additionally, unlike satellite-based AOD measurements, UVAI can qualitatively characterize the presence of absorbing aerosols and their spatial distribution characteristics even under cloudy conditions, thereby achieving daily global coverage.

7. Line 268. Revisit Table 1. I suggest including five columns: Sensor, Satellite, Product, Threshold, Reference.

Response: Thanks. We have supplemented Table 1.

8. Line 488. Replace cloud cover with sub-pixel cloud contamination.

Response: Thanks. We have replaced it.