

## **Review report amt-2019-174**

The present study deals with the assessment of SSA derived by the OMI sensor against the corresponding retrievals obtained from ground SKYNET stations. Most of the issues addressed here have been already discussed in Jethva et al. (2014, JGR) and therefore the contribution of the current work is relatively small. An “innovative” aspect is the availability of coincident OMI-SKYNET UV wavelengths (in contrast to AERONET) thus allowing the direct intercomparison between spaceborne and ground-based measurements. Nevertheless, a significant portion of the ground retrievals is coming from POM01 instruments (longer wavelengths of 400nm) requiring the extrapolation of OMI SSA based on the assumed aerosol model in the retrieval algorithm. Below are listed my comments which should be clarified by the authors prior the publication of the submitted manuscript.

1. **Lines 225-227:** The selection of degrees (variable with latitude) instead of distance has impact on the area which is averaged for the OMI retrievals. How much important is this for the overall results?
2. **Lines 235-237:** How much reliable are the aerosol models considered in the OMI retrieval algorithm? This is critical since an inappropriate selection of an aerosol model can lead to unrealistic SSA retrievals and subsequently will have impact on the intercomparison outputs.
3. **Line 244:** Please provide an explanation about the uncertainty limits (Q<sub>0.03</sub> and Q<sub>0.05</sub>). Have they been arbitrarily selected?
4. **Section 3.3:** Are there any quantified dependencies on the solar zenith angle, station altitude or aerosol layer height?
5. **Lines 389-395:** Unfortunately, the number of OMI-SKYNET pairs is limited in order to extract robust results. Moreover, how much can affect the irregularity of dust particles' shape? (see Gasteiger et al. (2011); <https://www.tandfonline.com/doi/pdf/10.1111/j.1600-0889.2011.00559.x?needAccess=true>)
6. **Lines 431-436:** These two sentences are confusing. Since the absorption signal increases with height why the SSA values are also increase (i.e., less absorbing particles)?
7. **Lines 442-444:** How exactly MODIS is used in the OMI near-UV surface albedo database?
8. **Section 4.2:** In the discussion of this section there are not plots quantifying the OMI-SKYNET declinations with respect to cloud contamination, aerosol layer height and the prescribed surface albedo.
9. **Figures 4-5-6:** Which is the difference on the obtained overall results when POM01 and POM02 SKYNET retrievals are grouped separately?