

# ***Interactive comment on “AEROCOM/AEROSAT AAOT SSA study, part I: evaluation and intercomparison of satellite measurements” by Nick Schutgens et al.***

## **Anonymous Referee #4**

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This work is very meaningful for the comprehensive comparison between these AOD, AAOD and SSA among POLDER-GRASP-M, FL-MOC, OMAERUV and POLDER-SRON, the results would help researchers to gain understandings and establish thresholds for selecting high quality aerosol measurements from satellites for model improvement, not only so but. I am not sure if it is typographical mistake, the blank space at the beginnings of almost all paragraphs should be removed. This study discusses three aerosol properties from four different sources, at the same time, conclusions from several previous studies (e.g., Schutgens et al 2020) are frequently used to compare the results of this study, all this would remind the authors that extra attention are needed when summarizing the results, otherwise the readers who are not familiar with these

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aerosol products might have difficulties to go through the paper and find what they want. The following details need to be addressed to make the description of this study more precise and consistent.

Line 100, FL-MOC is an acronym for what? Section 2.1.5, the DirectSun dataset and its validation is detailed in terms of the range of AOD values and type of aerosol. However, the dataset used in this study is not DirectSun product itself but a dataset (Kinne list) that developed using DirectSun product, it is unclear to be the uncertainties of Kinne list and its uncertainties. Please add more direct discussion of the data quality of Kinne list. Line 199, what's suitability here means? Line 200, be consistent with DirectSun or Direct Sun through the manuscript. Section 2.1.6 this part is not clear. Are POLDER-GRASP and POLDER-SORN sharing the same treatment of surface reflectance? How the sizeable uncertainty in Line 207 is determined? Do you mean a rather low correlation means independent? Probably some references are needed for detailing the reliance and difference among the satellite datasets. Descriptions within Lines 220-225 is not enough to understand the results in Figure 2. Figure 3, I didn't understand the two numbers (236 and 9083) here, could you please further explain? Is that the downward error bar of FL-MOC and OMAERUV have exceeded the limit of -0.2? How the error bar is computed? Line 729, do you mean there is a threshold for minimum number of observations, if yes, the threshold is ? Figure 7, Why the number of sites are different in three comparison? Line 228, the resolution of FL-MOC (2 deg.) is not consistent with the abstract (all products are aggregated unto 1 deg.) Section 3.1, the specific figure number should be mentioned here, like Figure 5 or Figure 6, because there are two Taylor diagrams in the figure list. Line 244, why this is unbiased? Line 254, how the bars are calculated should be added to the captions. Line 270-271, the sentence should be rewritten to "These hotspot identified by three products all cover these polluted regions like. . ." Line 271, what would be the possible reason for the exception? Line 280, please direct the readers where the discussion will be by giving the section number. Line 286, than found-> than that found Line 300, what 'several' means specifically? Line 301, the comparison should be made with caution in terms of

what?

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