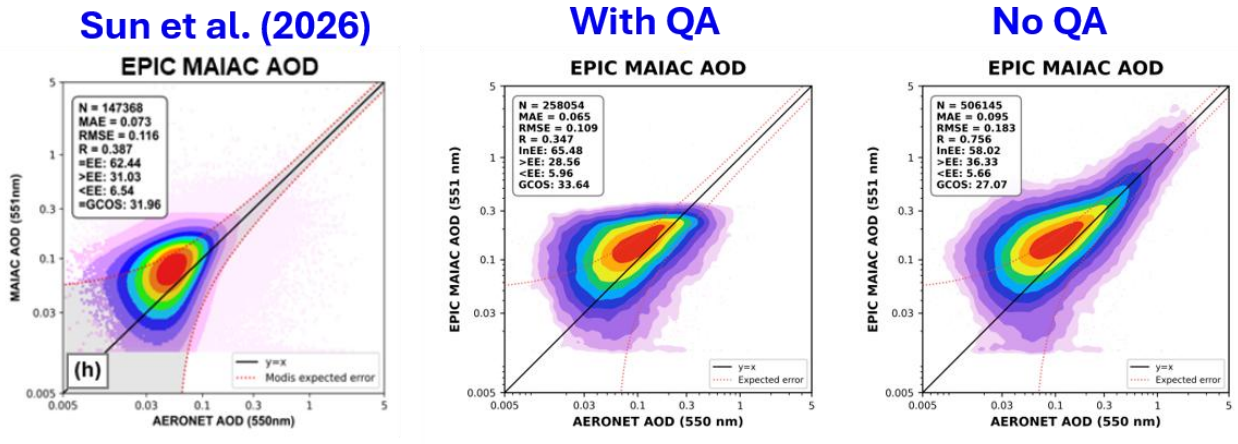
A REPLY TO AC1

I appreciate a detailed author's reply and hope that the revised manuscript will significantly improve. Below is my response to authors' reply to my Comment.

1. "We will remove Fig. 2g–h and any statements relying on these panel data to claim excessive superiority over existing products will be revised. We will discuss the published validation results as comparable benchmarks for our own results. We also wish to clarify that our method was evaluated using several different validation strategies. These results support the performance of our method under the corresponding validation conditions. The MAIAC and UV products were used only for cross comparisons and did not contribute to model training, parameter selection, or the generation of application results. Therefore, removing Fig. 2(g)-(h) does not change these numerical results.
… We would be grateful for any guidance you could offer on our use of these products. We accept that the discrepancy of our results and published validation statistics is very large to explain only by differences in collocation procedures. Therefore, we do not view the original comparison of MAIAC and UV as sufficiently reliable for quantitative assessment. Pending a complete re-analysis of our processing steps based on data provider guidance and literature, these comparisons are removed from the revised manuscript".

Reply: You should keep the comparisons, they show what you achieved with respect to the current state-of-the-art for EPIC. But the comparison should be fair and thought through not only in terms of improvements but also in terms of carefully analyzed deficiencies.

All validations we published for MAIAC EPIC described our protocol: we used the 50km window with requirement of at least 50% coverage. Please disregard the QA field which eliminates most of the high AOD values. It has never been used in MAIAC processing or in users' applications and analysis based on MAIAC EPIC atmospheric and surface products. I admit our omission of not updating the QA since its initial creation. Here is the correct validation statistics with (middle) and without QA (right) based on the two years 2020 and 2023 used in the paper.



As you can see, the proper validation (right) gives R=0.76 which agree with our published results. It also shows a much higher number of collocations, even for the case "with QA" equivalent to your analysis, therefore I recommend checking your code for residual bugs.

2. I accept explanation for Comment 2. However, cloud mask (CM) is an important undiscussed factor responsible for the differences between MAIAC EPIC, VIIRS and ML results. Aero uses ancillary CM from EPIC cloud algorithm. This algorithm is designed to detect bright and high clouds but it often misses sub-pixel clouds and low brightness clouds which are detected by MAIAC based on its knowledge of surface reflectance. MAIAC EPIC and VIIRS are consistent for two yellow circles in South Asia and Northern Siberia showing no aerosol signal. I recommend you to analyze the EPIC L1B RGB images to make sure you are not picking clouds.

3. Please read my original statement.

4. This is a good analysis. It highlights the real problem of Aero of severe underestimation of the high AOD events which are critical to the air pollution monitoring. Perhaps, you could address this issue in the future.

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