

Dear Editor:

We are very grateful for your careful inspection of our manuscript. All raised comments have been explicitly replied point by point and incorporated into the revision. We also thank two reviewers for their helpful comments which have improved the manuscript.

Thank you very much for your attention.

Sincerely Yours

Ye Kuang

General comment:

I would like to thank the authors for their revisions to the manuscript in accordance with the reviewers' suggestions. Before I can proceed with accepting the manuscript for publication, I would greatly appreciate it if the authors could kindly address a few points raised by the reviewers that still require attention.

Response: Thanks a lot for your time.

Minor Comments:

Comment: Line 320: The sentence is still not clear. I would suggest a more linear form as follows: This suggests that the chemical processes responsible for the increase in $mr_{1064,400}$ have minimal influence on the chemical properties of aerosol particles near 235 nm, and that variations in $mr_{1064,400}$ and 323 $mr_{1064,235}$ are governed by different chemical and emission processes.

Response: Revised accordingly.

Comment: I could not find Figure 1 in the revised version.

Response: We have ensured that all figures are appropriately presented in the manuscript.

Comment: Line 510: You might revise the sentences to make it clearer. I would suggest: “This is likely associated with that MOOA in Guangzhou urban area is mainly formed through multiphase reactions (Zhai et al., 2023) thus it is expected to have higher mr , as demonstrated by Li et al. (2017).”

Response: Revised accordingly.

Comment: Line 512: it is not clear what the authors want to communicate. Do they want to point out that the results from laboratory studies differ from their observations because most of the laboratory studies focus on gas-phase reactions? Please clarify.

Response: Yes, that is exactly what we intend to emphasize. We revise sentences here as: “However, as summarized in Moise et al. (2015), most existing laboratory studies that conducted in the context of gas-phase reactions reveal the increase of O/C would generally decrease m_r at the O/C range of LOOA and MOOA of this study (0.6 to 1.27). The finding here is likely associated with that MOOA in Guangzhou urban area is mainly formed through multiphase reactions (Zhai et al., 2023) thus it is expected to have higher m_r , as demonstrated by Li et al. (2017).”

Comment: Line 412: one of the reviewers asked if the correlation coefficients of 0.25 and -0.24 could be considered significant. The authors correctly underlined that the significance depends on the number of data points. I suggest to quantify the significance of the correlation with an appropriate statistical test that consider correlation coefficient and population size.

Response: P-values from t-tests were added. For both correlation analysis, p-values are below 0.01, indicating that the correlations are statistically significant: “Especially, the $m_{r1064,400}$ showed obviously higher correlations with MOOA ($R=0.25$, $p<0.01$) than with LOOA ($R=-0.24$, $p<0.01$) (Fig.S11)”