

Atmos. Chem. Phys. Discuss., referee comment RC2
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Comment on acp-2021-198

Anonymous Referee #2

Referee comment on "Competing effects of aerosol reductions and circulation changes for future improvements in Beijing haze" by Liang Guo et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-198-RC2>, 2021

Review of "Aerosol reductions outweigh circulation changes for future improvements in Beijing haze (MS# ACP-2021-198)" by Liang Guo et al.

Based on the calculated PM_{2.5} concentration and two indices measuring the likelihood of haze in Beijing, this study evaluates the relative role of atmospheric circulation and aerosol emission in determining the future haze in Beijing in CMIP6 models. It suggests that the intensity of aerosol emission outweighs the changes in atmospheric circulation and dominates the future changes in haze days. The results are reasonable. I recommend the authors clarify the following two aspects before I give my next round of recommendations. Details are listed below.

1. At least for me, it is entirely within the expectation that the aerosol emission dominates the haze days when the emission reduces to a certain level. I do not think this conclusion alone is publishable. Nevertheless, it is meaningful to evaluate and explain when the effects of aerosol emission are comparable to those of circulation change in determining the haze days in Beijing.

2. Can the concentration of PM_{2.5} represent the haze? I think the answer is no. If my understanding is correct, the title and related expressions need changes in the manuscript. If there is no better way to represent haze in CMIP6 models, I suggest the authors adding some discussions to clarify the limitations of this approach.