

Comment on acp-2021-433

Anonymous Referee #2

Referee comment on "Response of particle number concentrations to the clean air action plan: lessons from the first long-term aerosol measurements in a typical urban valley in western China" by Suping Zhao et al., Atmos. Chem. Phys. Discuss.,
<https://doi.org/10.5194/acp-2021-433-RC1>, 2021

This paper presents a long-term and high-resolution PSD dataset at urban Lanzhou in northwest China, within a valley, to evaluate the emission control impacts to air quality using some statistical methods. This paper focused on an interesting topic, with novel results that are important and significant for formulating air pollution control plan by the policymakers. I suggest this manuscript can be accepted for publication by ACP after minor revision.

Minor comments:

- Climate and environmental effects of aerosol particles largely depended on their optical properties, and thus the variations in optical parameters during the measurement campaign should be explained or referred to some the published important works in Introduction. AOD and Alpha, two important optical parameters of aerosol particles, were analyzed during the campaign. However, the statement of relevant instrument should be given in the section of "Data and methods" of the revised manuscript.
- The limitations on used data such as only a sampling site and used analyzing method should be given, and future works should be preliminarily introduced by 1-2 sentences in the last paragraph of the conclusions.
- All abbreviations should be defined when they firstly appear throughout the manuscript, such as NPF, particle number in different size bins (N_{13-25} , N_{25-100} , $N_{100-800}$).
- The sampling site should can represent urban background. Please explain that in the section of "Data and methods".
- The formation and evolution of air pollution may be more complex inside the basin as compared to that at the plain due to terrain and PBL impacts. Therefore, difference of aerosol pollution between inside the basin and the plain and the climate and environmental effects should be introduced in detail in the section of Introduction.
- Only some novel findings should be clearly listed in the conclusions, and thus that should be revised to provide some key conclusions.
- All figures in the manuscript should be revised and largely improved for seeing more

clearly by readers.