

Atmos. Chem. Phys. Discuss., referee comment RC1
<https://doi.org/10.5194/acp-2020-1311-RC1>, 2021
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Reviewer comment

Anonymous Referee #1

Referee comment on "Seasonality of the particle number concentration and size distribution: a global analysis retrieved from the network of Global Atmosphere Watch (GAW) near-surface observatories" by Clémence Rose et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2020-1311-RC1>, 2021

Based on data collected at 62 ground-based sites around the world, spatial distributions of aerosol number concentration and particle number size distribution are presented. The data are segregated by site type (e.g., polar, urban, mountain, etc.) and degrees of seasonality and diel cycles are reported and explained. This paper is a massive effort and the authors should be commended for a job well done. The paper is well written and will provide a lasting resource for modelers to assess simulated aerosol number and size distributions regionally and globally. I only have the very minor comments listed below.

Page 5, lines 10: There have been many long-term trend analyses of optical properties, number concentration, and PNSD. Does this refer to analyses involving several sites? Please clarify in the text.

Page 6, line 10: Why 2016 and 2017? Please explain in the text.

Figure 1 and throughout: The symbols in the legend box should be larger.

Figure 1 caption: It would be helpful if MPSS were spelled out.

Page 6, line 18: What is meant by "(sub)-urban"? Does it include both suburban and urban? As far as I can tell neither it or "suburban" are used anywhere else in the paper.

Page 7, line 9: What is the definition of "large" particles as used here?

Figure 10: It is difficult to tell the difference between the size of the symbols. Please change so that the size difference is clear. The yellow symbols are difficult to see. Can these be changed to another color?

Also – up to here the coefficient of determination (r^2) has been used to describe the significance of the correlation between two parameters. Why is the Spearman's rank correlation coefficient being used here?

Page 40, line 5: change to "RESIDENTIAL"