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Discussions

Interactive comment on "Submicron aerosol composition in the world's most polluted megacity: The Delhi Aerosol Supersite campaign" by Shahzad Gani et al.

Anonymous Referee #1

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The study by Gani et al. reported submicron aerosol composition in a highly polluted city in India based on more than one-year measurement with an aerosol chemical speciation monitor. The seasonal variations in aerosol species, and roles of meteorology were characterized. Several episodes with extremely high concentrations of chloride and organics were discussed. The authors also investigated the relative importance of primary and secondary aerosol in different seasons. Overall, this study fits within the scope of ACP. Considering that Delhi, India can be a highly interested megacity in air pollution studies in the future, the results of this study are worth for publication. I have some comments below:

My major concern is the PMF analysis in this work. Although it seems not the focus of this study, the authors need to show more details about the PMF procedures, diagnostics, evaluation of the solutions. For instance, how PMF was performed? PMF was performed to the entire dataset or seasonally datasets? The authors mentioned that they can identify biomass burning OA factor during specific periods. I strongly encourage the authors to show more factors, which can help interpret the conclusions in the text (e.g., the impacts of agricultural burning in page 10, line 19).

The calculation of CE is a bit strange (page 13, line 10). The authors concluded that "the molar ratio of the inorganic anions to cations (ammonium) was 0.98 (R2 = 0.89)", suggesting that particle acidity should not be a factor affecting CE, while the authors applied acidity dependent CE. Suggest the authors presenting measured versus predicted ammonium. In addition, high concentration of chloride might not be completely in the form of ammonium chloride, may be KCl. This will also affect the estimation of particle acidity.

Page 13, line 9, the nafion dryer only decrease RH to less than 80%? Suppose to be much more efficient than this.

The PBLH in Figure 2 seems not right. For example, PBLH remained above 1.5 km from April to June. Please check the NASA meteorological reanalysis dataset. The PBLH output from MERRA2 might have large uncertainties.