Interactive comment on “Diagnosis of dust- and haze pollution-impacted PM$_{10}$, PM$_{2.5}$, and PM$_{1}$ aerosols observed at Gosan Climate Observatory” by Xiaona Shang et al.

Anonymous Referee #2

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This work reported five-year measurements of the mass concentration and composition of PM10, PM2.5 and PM1 at Gosan climate observatory. Based on the concentration of soluble ions and OC/EC data, PCA and distribution frequency analysis were performed to understand the influence of soil dust and anthropogenic pollution on bulk aerosol. Although the authors provided long term dataset of PM at this observation site, the results are not so attractive based on their analysis. At the current state, it is not publishable on ACP. 1. As for principle component analysis, three factors explained 71% of the total variance. It means 29% of the variance was not explained. The residue was quite large. What’s the possible contribution for this unexplained part? 2. Because the number of the tracer was limited and the tracers were lack of uniqueness,
the results about source apportionment were not so robust. For example, PC3 was
-dominated with NH4+ and Ca2+, while secondary formation of NH4+ might also lead
to the correlation between NH4+ and Ca2+. 3. The time series of mass concentration
for each PC should be given after the PCA data. This is important for understanding
the sources of PM. 4. It was unclear about the diagnosis of dust and haze based on
frequency distribution. There was no robust criterion to differentiate haze from dust
events. As shown in Fig.4, the mass loading of PM on dust or haze events varied
greatly. The data could not well support the conclusions drawn by the authors.

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