

***Interactive comment on “Diagnosis of dust- and haze pollution-impacted PM<sub>10</sub>, PM<sub>2.5</sub>, and PM<sub>1</sub> aerosols observed at Gosan Climate Observatory” by Xiaona Shang et al.***

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This is an article about Diagnosis of dust- and haze pollution-impacted PM<sub>10</sub>, PM<sub>2.5</sub>, and PM<sub>1</sub> aerosols observed at Gosan Climate Observatory. I have some comments and suggestions.

-Introduction, this section didn't write about the main content such as pollution characteristic of water ions, OC and EC in PM, method of source apportionment. -Line 105-106, please add the map of sampling site. -Line 104-108, how about temporal distribution of the samples or how many samples in each season per year? -Line 109-110, what are the standards of dust event and haze event? -Line 115-116, what is

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the method or condition of extracted water-soluble ions? How about extraction times? How to ensure the extraction efficiency if only one extraction? -Line 144, “of these species. . .and EC were pre-dominant. . .,” from Table 1, EC maybe OC. -Line145-146, “In comparison, about 65% of OC was partitioned into PM1. It was even less for NO<sub>3</sub>- as 33%”. These two sentences are not clear. -Table 1, Please add minimum, maximum, median, percentile(10th, 90th) inTable 1 and revise mean+ $\sigma$  to mean $\pm$ SD. To revise title of Table 1. -Please add figure to show the species proportion in PM. -Line 153-168, the describe for figure 2 is not accurate. -PCA analysis of PM, two components are usually selected, but it uses three components in multi-linear regression analysis, why? I don't think it is right to using mass of PM as factor in PCA analysis because mass of PM acts as dependent variable in multi-linear regression analysis. -I think it exists errors if the study didn't exclude dust and haze event in PCA analysis. -Perhaps you maybe use PMF model to analyze source of PM. -Line 49-52, Please add the instrument condition of analyzing ions. How about pretreatment of PM samplers for ions analysis and how to quantify the concentrations of ions? -what is basis of dust and haze diagnosis based on method using in this study. -Conclusions, this section is too long. -Table 1 and 3 can be merged. -Figure 1, There are no data of winter in 2009 and spring in 2011 and 2012. It is scare of persuasion based on Figure 1 about spring.

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