

Interactive comment on “Seasonal variation and chemical characterization of PM_{2.5} in northwestern Philippines” by Gerry Bagtasa et al.

Anonymous Referee #1

Received and published: 8 December 2017

This paper describes the seasonal change of PM_{2.5} characteristics on the basis of the sampling data taken at the northern part of the Philippines. The chemical component analysis coupled with the back trajectory study has revealed that the fine aerosols are composed of natural origins, local emissions, and long range transport effects. As a whole, the paper conveys useful insight into the air quality analysis in the quoted region. In order to improve the quality of the paper, the reviewer recommends the authors to consider the following issues.

(major) p.6 Please give a brief explanation why the OC/EC ratio below 2 indicates the dominance of primary aerosol. p.6 “daytime sea breeze pushes back these polluted air masses inland”: is there any observational evidence or supporting data for this situation? p.8 “heavy metal components come from several different sources”: what

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are the most plausible sources? p.8 “the ratio of $\text{NH}_4^+/\text{SO}_4^{2-}$ ”: isn’t it necessary to consider the charge balance in this case? If so, the ratio between $2(\text{NH}_4^+)$ and (SO_4^{2-}) must be considered instead? p.8 “the minimum Q value”: a brief explanation of the Q value would be of help. p.9 A brief explanation if the “enrichment factor” will be of help. p.10 The paragraph describing figure 12 should be moved to the text, not conclusion. p.17 If possible, it would be better to move the panel indications (a)-(d) to just above each panel, not below. Moreover showing the season nearby the panel as (a) Summer, for example, will be effective for seeing the differences in the four seasons. (The same applies to other figures.) p.17 Fig. 2: the unit mm should be shown at the side of the color bar. What exactly was the accumulation time for the “accumulated rainfall”? p.18 Fig.3: at the vertical axis, the unit $\mu\text{g}/\text{m}^3$ should be shown with parentheses. In fig. 4 the vertical axis should show the quantity, not only the unit. p.19 Fig. 5 and p.21 Fig. 8: it would be better to employ different symbols (such as open circle, filled circle, etc.) to indicate different seasons. Also, the meaning of each line must be explained in the caption. p.20 Fig. 6: the panels (a), (b), ...should be mentioned in the caption. The same for Fig. 7. p.22, Fig. 8: The unit ($\mu\text{eq m}^{-3}$) should be shown with parentheses. p.23 Fig. 9: panels should appear with (a) - (f). The same for Fig. 10. p.25 Fig. 11 The axes should be with the quantity and unit, not just (modeled) and (measured). p.26 Fig. 12: in the caption, the difference in four seasons should be explained explicitly. By using different symbols for different seasons, the figure would be more directly understandable.

(minor) p.1 “The seasonal and chemical characteristic of ... was” -> The seasonal and chemical characteristics of ... were p.1 The values of 21.59 and 8.44 should be 21.6 and 8.4 $\mu\text{g m}^{-3}$, respectively. p.1 “USEPA PMF” should be spelled out. (In p.4, it is spelled as “US EPA”.) p.1, p.2 “Long Range Transport (LRT)” should be “long range transport (LRT)”? Please check the policy of the journal. p.1 “LRT of industrial emission ... have” should be “The LRTs of industrial emission, ... have” p.1 “Aerosols are known ... but also on its effects on ...”: “its” should be “their” p.1 “Rapid industrialization ... has led to”: “has” should be “have”. p.1 “High emissions from ... is transported

...": "is" should be "are". p.2 "factors like" should be "factors such as". p.2 "Its effects cover large regions of SEA.": this part should be connected to the previous sentence, for instance as "the effects of which cover ...". p.2 "The life cycle of these aerosols and its impacts on ...": what are "these aerosols"? "its" should be "their"? p.2 "the main source of regional stratospheric air.": is this part correctly describing the exact situation? p.2 "Leading to observed elevated levels of ...": an incomplete sentence. p.3 "atop a 3 storey building": "storey" should be "story". p.3 "Except for the summer sampling period": an incomplete sentence. p.4 "One for" should be "one for". p.4 "without heating the filter" should be "without heating. The filter". p.4 "FNL final reanalysis": FNL should be explained. p.4 "disaggregated": is this a proper wording? p.4 "in this study" should be "in the present study". p.5 "from the SCS making" should be "from the SCS, making". p.5 "And in fig. 2d": please avoid starting a sentence with "And". p.5 "early 2016 are" should be "early 2016 were". p.5 "we expect its sources to ...": the meaning of "its" is not clear. p.5 "to be significant influence by" should be "to be significantly influenced by". p.5 " 0.67 ± 0.3 " should be " 0.67 ± 0.30 ". p.5 "Measured EC likely" should be "Measured EC is likely". p.7 "used as tracer": "used as a tracer". p.7 "shown table 2": "shown in table 2". p.7 Please italicize variables r (correlation coefficient) and p (confidence interval). p.7 "in the proceeding section": "in the following section". p.7 "The seasonal concentrations of which are": an incomplete sentence. p.7 "Seasonal variation of heavy metals ... are": "Seasonal variations of heavy metals ... are". p.7 "Ambient concentration of ... depend on distance": "Ambient concentrations of ... depend on the distance". p.8 "the ratio ... are also found to be": "the ratio is also found to be". p.9 "the wind back trajectory analysis discussed": "the wind back trajectory analysis discussed above". p.9 "strong associations with the heavy metals ...": the heavy metals are not quoted in table 4 discussed here. p.9 "mass concentration. Providing": "mass concentration, providing" p.9 "This study describes": "This study has described". p.10 "respectively. Both": "respectively, both". p.10 "air masses originating from East Asia moves": "moves" should be "move" p.10 "when lowest": "when the lowest". p.16 The reference Zhu et al., 2017 should be listed in the reference section, not

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below table 1.

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2017-931>, 2017.

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