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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Ground based characterization of spectral optical properties of haze and Asian dust episodes under Asian continental outflow during winter 2014" *by* Jinsang Jung et al.

Anonymous Referee #2

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General Comment The manuscript discusses the characterisation of spectral optical properties of particles collected during haze and Asian haze episode in Daejeon, Republic of Korea during winter 2014. This study suggest PM2.5/PM10 mass ratios and Å(450/700) can be used as tracers to distinguish aged LRT haze and Asian dust under the Asian 39 continental outflow. Overall the study is very interesting unfortunately the information given in especially in the abstract and introduction still need to be improved. I suggest the authors to focus on the information haze and Asian dust episodes in their introduction. The period of study is too short to indicate the differences of these two episodes which only separated within few days. The comparison between haze

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and Asian haze episode is not well discussed based on overall data including PM2.5 compositions.

Detail Comment 1. It's hard to understand information in the abstract clearly. I suggest the authors rewrite their abstract with clear problem statement, main objective, main methodology, main finding and conclusion from the research finding. 2. The introduction does not clearly present the problem statement of the research clearly. No explanation on the source haze and Asian dust and different characteristics of the particles from these two different sources from previous studies. 3. Line 61. Why only optical properties of LRT haze need to be studied. I suggest the authors write the need of the study such as in Line 51-53 and Line 61 -63, Line 70-72 in the last part of their introduction. 4. Line 85: Why this study only conducted during winter season? 5. Line 81-83: Any reason why the single scattering albedo was different when the air mass coming from different directions? 6. Line 85: Any particular reason on why this stud only conducted during winter? 7. The subtitle for section 2.1 is "Measurement site" but the authors explain about the online measurements of optical properties and manual sampling for PM2.5. I suggest the author to be more specific in their information under the sub-title. 8. Section 2.5: Is this section explain the determination of chemical composition of PM2.5? Please include the information in the title and main text for this sub-title. 9. On- month duration study with three episodes of haze can be considered short time for this kind of study. 10. How the authors define "haze condition" on 12, 17 and 20th January 2017? Haze usually relates with low visibility and high concentration of PM. Any cutting value for PM concentration? 11. Line 397: What the author mean by "stagnant atmospheric condition"? 12. Line 289: Why the authors only focus on second and third haze episodes? Any particular reason? 13. Line 298-299: What high concentration of K in PM indicates for the source of aerosols? Is K concentration based on measurement from PM2.5 compositions? Is there any mixture of haze and desert dust from this study? I asked this because the time period between these two episode are very close (only three days). 14. Line 305: Any explanation on why the compositions of PM2.5 were only measured until 17th of Jan 2014 (Figure 8). The composition

PM2.5 from third episode need to be measured for comparison. 15. Conclusion: What are the cutting points to indicate haze and Asian dust episode base on PM2.5/PM10 ratio and Å(450/700)? 16. Is there any influence of local source as one of the limitation of this study?

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