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Atmospheric Chemistry and Physics Discussions

Interactive comment on "An intensive study of aerosol optical properties in Beijing urban area" *by* X. He et al.

Anonymous Referee #1

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General comments:

Review for "An intensive study of aerosol optical properties. . ." by He et al. The paper analyzes absorption coefficient, scattering coefficient and single scattering albedo (SSA) of aerosol based upon two-year's ground-based observations. This reviewer thinks that the analysis of the paper has seriously problems, and has many misleading conclusions. As a result, this paper is lack of scientific merit for ACP, and cannot be accepted for publication. The detailed comments are as follows.

Specific comments:

1) The main focus of this paper is to obtain the absorption coefficient by applying the measured data from Aethalometer. The reviewer thinks it is questionably to use the

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conversion factor 8.28 for black carbon concentration to absorption coefficient. As a site dependent factor, the factor of 8.28 which obtained in south china in the paper cannot be directly applied in northern China. Thus, the result in the paper is doubtfully and may mis-lead readers.

2) The statement and its citation of "The Beijing aerosol contains a high amount of black carbon...vehicle exhaust particles" (P11416-2∼4) are improper. Some citations are based upon very short period observation, and they are not suitable to support this statement. This reviewer thinks that some source appointment literatures should be included to defend this statement.

3) The statement of "The dependence of. . .is rarely studied." (P11416-22∼23) is not true. The author omits a number of Chinese literatures which related to this study.

4) Without any of observation data regarding boundary layer, the analysis of boundary layer impact on BC concentration in this paper (P11420-18∼21, P11425-11∼12) is too superficial to be believed. .

5) The paper attributes the difference between summer and winter scattering coefficient to secondary sulfates formation based upon a pervious work conducted in 2000, which is outdated and has a large uncertainty.

6) The paper attributes the higher scattering coefficient to the higher RH in summer, which the higher hygroscopic growth of aerosols leads to larger particle size (P11422-8∼11, P11422-21∼22, P11425-21∼23). This statement is conflict to the previous statement that in which the authors claimed that the nephelometer has an auto heater to maintain the RH of inlet flow below 60%. So the scattering coefficient observed in this study just depends on the dry aerosol and should be independent with the RH.

7) Based on the two years observation, the author deduces that the scattering coefficient is higher in 2006 than in 2005 (P11422-13∼15, P11425-7). Such conclusion has no statistical meaning and is too arbitrary. The variability and trend of scattering

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coefficient is very complicated, and not be determined by the 2 year result.

8) The explanation of relationship between scattering coefficient, absorption coefficient, SSA and wind is confusion. For example, the analysis on Figure 7 is improperly conducted.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 11413, 2009.