

***Interactive comment on “Correlation of black carbon aerosol and carbon monoxide concentrations measured in the high-altitude environment of Mt. Huangshan, Eastern China” by X. L. Pan et al.***

**Anonymous Referee #3**

Received and published: 26 July 2011

**General comment:**

The authors have presented results of continuous measurement of BC in fine-mode aerosols (PM<sub>1</sub>) and CO mixing ratio at a high-altitude background station (Mt Huangshan) collected from 2006 to 2009. The authors have also investigated the BC–CO relationship of urban plumes originating from different regions in Eastern China. The data-set is important in order to understand the atmospheric transport of BC and CO as well as removal of BC. The paper is well written and structured and may be published after some revision.

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**Major comment:**

Introduction section is too long, several of the statements are not relevant to the present study. The introduction section should be truncated heavily. The  $\Delta\text{BC}/\Delta\text{CO}$  ratios are of similar value for three different air-masses and require better explanation. The BC loss is discussed at higher RH and in the presence of anthropogenic aerosols without stating proper evidence and references. Also, authors should provide detailed account of how BC loss was estimated?

**Specific comments:**

P4453, L2-19: Purpose needs to be well defined? It is important to state uncertainties related to MAAP measurements. This paper does not deal with the uncertainties in the measurement of BC by different techniques. Authors should refer to their own measurements.

**Technical corrections:**

P4448, L4: Replace (PM<sub>1</sub>) with “mass in fine-mode (<1 μm)”

P4448, L6-7: Please add the months for autumn and spring periods

P4448, L14-16: Does the numbers represent 1 standard deviation of the measurements? What are the uncertainties in the measurement of BC (by MAAP) and CO? This has implications to the results of this study. For example,  $\Delta\text{BC}/\Delta\text{CO}$  ratios for the three different air-masses may be of similar value (within measurement uncertainties). Please provide appropriate explanation for similar ratios observed in three different air-masses.

P4448, L19-20: Please provide supporting evidence (s).

P4448, L27-28: How travel time was estimated?

P4449, L3: Replace with "produced by"

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P4449, L7: Replace with "solar"

P4449, L11: BC is anthropogenic only. There is no natural source of BC.

P4449, L15: Replace with "deposition on snow surfaces"

P4450, L2: Delete the word "loading of"

P4453, L7: Delete the word "organic matter or"

P4453, L2-19: What is the purpose of talking about uncertainty in measurement techniques?

P4453-54, Last paragraph: So much discussion on measurement of CO but the important point is missing. What is the uncertainty in the measurement of CO using the CO analyzer?

P4465, L6: Delete "by Kondo et al" as reference is provided at the end.

P4464, L22: The dry deposition of BC by collision seems to be unrealistic as BC particles are much smaller (~100-200 nm) in size.

Section 7, P4465, L5 onward: Please provide a detailed investigation on how BC loss was estimated. Also, provide supporting data (or appropriate references) of WSOC,  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$  to support the aging processes. What about the presence of dust as it can neutralize acidic species and thus, can affect the aging of BC? What is dust content in aerosols?

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Interactive comment on Atmos. Chem. Phys. Discuss., 11, 4447, 2011.