

Interactive comment on “Observations of aerosol optical properties at a coastal site in Hong Kong, South China” by Jiaping Wang et al.

Anonymous Referee #2

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The paper presents an interesting study of aerosol optical properties over the coastal site of Hong Kong, using three years of data registered with in-situ near instrumentation operated close to the surface. Both the topic and the dataset analyzed make the study worthy to be published in ACP after some revision from the authors.

General comments

Main issues to be solved include the addition of detailed information on quality assurance and associated uncertainties of the different variables analyzed. Furthermore, the authors must carefully revise the number of significant figures used in Tables 1, 2, 3 and 4 and along the text. Table 4 must include more statics information than the simple average, just for giving an idea of the spreading of the data around the mean.

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Detailed comments

On Page 1 line 16 the authors write 150.6 Mm⁻¹ for the average light scattering that according to Table 1 presents a STD of 99.4 Mm⁻¹. This must be change both in the text and in the table by 150+-100 Mm⁻¹. This procedure must be applied to variables that also present an excessive of significant figures, like absorption coefficient, SAE, Ntotal, GMD and m0.8. This suggestion is based on the fact that using an excessive number of significant figures for the STD is not appropriate. Furthermore, the experimental errors and their propagation are also against the excessive number of significant figures both for the STD and Averages, that must be expressed with coherent significant figures.

In the abstract, line 21 the authors use $\Delta BC / \Delta CO$ for the ratio BC concentration over CO concentration, but in the text they change the notation in some cases, this must be carefully revised and corrected.

On Page 2, line 22 the authors use for the first time in the paper the acronyms LPDM and PSC, so they must include their respective meanings.

The reference Cazorla et al., 2013 is missing in the reference list.

On page 2 line 23, the comment should be enriched using the reference: “Valenzuela, A., Olmo, F.J., Lyamani, H., Antón, M., Titos, G., Cazorla, A., Alados-Arboledas, L., Aerosol scattering and absorption Angström exponents as indicators of dust and dust-free days over Granada (Spain). Atmospheric Research, 154, pp. 1-13. 2015”.

On page 4 line 26 the meaning of the acronym CAB must be detailed.

As explained in the general comments, it is necessary including information on the uncertainties for the different experimental and derived variables analyzed in this study.

The UFP monitor presents some limitations that have been described in the literature, see for example: - Hillemann, L., Zschoppe, A., Caldow, R., Sem, G. J., and Wiedensohler, A. (2014). An Ultrafine Particle Monitor for Size-resolved Number Concentration Measurements in Atmospheric Aerosols. J. Aerosol Sci., 68:14–24. - Gómez-Moreno,

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F.J., Alonso, E., Artíñano, B., Juncal-Bello, V., Iglesias-Samitier, S., Piñeiro Iglesias, M., Lopez Mahía, P., Perez, N., Pey, J., Ripoll, A., Alastuey, A., De la Morena, B.A., García, M.I., Rodríguez, S., Sorribas, M., Titos, G., Lyamani, H., Alados-Arboledas, L., Latorre, E., Tritscher, T., Bischof, O., 2015. Intercomparisons of mobility size spectrometers and condensation particle counters in the frame of the Spanish atmospheric observational aerosol network. *Aerosol Sci. Technol.* 49 (9), 777e785. <http://dx.doi.org/10.1080/02786826.2015.1074656>. In this sense, some comments and the appropriate references must be included in the instrument section.

In section 2.4 the authors present information on the data processing followed for deriving m0.8 including a value for the particle density that requires justification and a reference.

Section 3.1 and Table 2 must include additional studies developed with similar instrumentation in other urban locations affected by mineral dust transport: Lyamani., F. J. Olmo, and L. Alados-Arboledas. Physical and optical properties of aerosols over an urban location in Spain: seasonal and diurnal variability. *Atmospheric Chemistry and Physics.*, 10, 239-254, 2010.

The discussion on page 7 on BC, including the comments on temporal trends, could be enriched considering the next reference: Lyamani, H., F.J. Olmo, I. Foyo, L. Alados-Arboledas. Black carbon aerosols over an urban area in south-eastern Spain: Changes detected after the 2008 economic crisis. *Atmospheric Environment*, Volume 45, Issue 35, Pages 6423-6432, 2011

Interactive comment on *Atmos. Chem. Phys. Discuss.*, doi:10.5194/acp-2016-833, 2016.