

Interactive comment on “Comparison of aerosol properties from the Indian Himalayas and the Indo-Gangetic plains” by T. Raatikainen et al.

Anonymous Referee #2

Received and published: 7 June 2011

General comments:

The paper by Raatikainen et al. presents seasonal and diurnal differences of meteorological parameters, and micro- as well as optical properties from two sites in northern India, Gual Pahari and Mukteshwar.

The paper is well written and the scientific content is generally acceptable to be published in ACP. Nevertheless there are a number of critical points concerning the presentation style of the data, the novelty of the content, the general message of this paper, and the traceability of results.

The title of this paper is comparison of aerosol properties from the Indian Himalayas and the Indo-Gangetic plains. Large parts of the text however, present meteorolog-

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ical and climatic parameters at the two sites. This should be shortened in favor for the aerosol measurements. Only meteorological data should be presented, which are relevant to interpret the aerosol data.

There is a loose presentation of data measured at the station with no common conclusion (e.g. some optical parameters are described in the text and data are shown in Figure 5, but common conclusions about optical properties are missing in the abstract as well as in section 4.)

The paper does not present neither novel concepts nor new data (most of the discussed data presented in the paper was published before by Komppula et al., 2009 and Hyvärinen et al. 2009, 2010). Also some Figures (e.g. Fig. 9) are presented elsewhere. Can the measurements at the two sites give some new insights on how the (extreme high) aerosol concentrations at Gual Pahari influence the monsoon cycle as stated in the introduction?

For the referee it is not clear, what is the final contribution of this paper for the scientific community in relation to the other three publications. The approach of the boundary layer dynamics on the aerosol concentration is really good. I would therefore suggest rewriting the paper focusing more on the boundary layer dynamics. I appreciate to intensify the discussion on the boundary layer dynamics effect, maybe by incorporating the radiation measurements at the sites.

For the above mentioned reasons I recommend a major revision of the paper.

Specific comments:

Please avoid words like “relatively”, “mostly”, “it looks like”, “interestingly” in favor to be more specific.

P11420 line 5 a.s.l. is not introduced

P11420 line 17-19 The description of the measurement site should be given in section 2.

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P11420 line 25 "These instruments were sampling from" should be "These instruments sampled the aerosol behind a PM10 inlet"

P11421 The last sentence of section 2.1 could be cleared.

P11421 line 15 "Most of the data" Which data?

P11421 line 18 Please explain why 50% minimum data coverage was used.

P11421 line 21 (12 points), (24 points) could be cleared.

P11422 line 14 How is the rainfall rate in Mukteshwar calculated?

P11425 line 5 Please avoid unusual units like $\mu\text{cm}^3\text{m}^{-3}$. I've never seen it before.

P11426 line 16-25 This paragraph should be combined with the description of the wind measurements in P11425 line 7-17

P11428 line 17 Explain the q-value

P11429 line 11 "When applicable,..." This sentence could be cleared.

P11429 line 22 The same size range should be used for comparison.

P11429 line 25 "Averaging, however, helps a lot." Please avoid such a phrase.

P11430 Explain why the total and >40nm particle number concentration is so high during monsoon. Should they not be deposited by wet deposition?

P 11431 "wave length" should be "wavelength"

P 11431 Refine the definition of the absorption Angström exponent.

P11431 line 26 The reference Hyvärinen et al., (2011b) is missing in the reference list.

P11432 line 11 Why favors wet deposition hygroscopic particles. Please clarify. Hygroscopicity is a measure of the affinity of a particle to absorb water, whereas deposition is a wash out process. What is the connection of both?

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P11433 line 33 "quite low" Give a number.

P11436 line 7 "good correlation" How good? Give a number.

P11436 line 9 Why is a ten day running mean used? Please clarify.

Technical corrections:

Generally, the quality of the Figures should be improved. Use logarithmic axis if necessary. Multiplication with a factor (e.g. 4 in Figure 6) is unusual and should be avoided.

P11424 line 4 "Here,..."

P11424 line 10 "The available data presented here including..."

P11425 line 18 "Time series of the meteorological data are shown including monthly..."

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 11417, 2011.

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