

## ***Interactive comment on “Effect of the summer monsoon on aerosols at two measurement stations in Northern India – Part 2: Physical and optical properties” by A.-P. Hyvärinen et al.***

### **Anonymous Referee #2**

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The objectives mentioned (p. 1752, line 14 – 25) are impressive but the end leads to the simple observation. However, after reading the whole paper, I would suggest to combine the paper with companion paper (Hyvarinen et al., 2011) if it is still possible, at least with the BC data. For this paper to be accepted in current format, authors should improve discussion rather than simply presenting the results as in many cases. 1. It is suggested to provide more information about the measurement locations under subtitle 2.1 (p. 1753). Lack of information about measurement sites in the same paper makes comparison of data very difficult. 2. Meteorological parameters were measured (p. 1753, line 10 – 15) but not presented anywhere. Why to mention these parameters if not used in the result or helpful for any discussion? 3. P. 1754, Line 6 (In addi-

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tion, aerosol. ....) is not necessary. 4. P. 1754, Line 14 -16, how many years of rainfall record available for the area? 5. It seems obvious that the concentration and sizes of aerosols varies as pre-monsoon > post-monsoon > monsoon. However, explanation provided for the similar size distribution (page 1756, line 5-7) is not convincing. Why is raindrop not effective for washing/scavenging the particles sizes in the range of 3  $\mu\text{m}$ ? If accumulation mode particles were removed more effectively than the Aitken mode by wet deposition (p. 1755, line 10 – 12), then why not particles of coarse mode? Explanation needed. 6. It is mentioned that the sources are an important factor affecting the variability of aerosols (p. 1756, line 10), but what could be the sources of mineral dust? 7. Why there is very little information about the SSA in Gual Pahari during monsoon (p. 1757, line 18)? 8. What could be the possible reason for the “substantially similar” properties of aerosols despite the “different annual variation “of absolute concentrations at both stations (p. 1757, line 22 -24)? 9. P. 1758, line 28, how does the RH affect the particle sizes? Reference required. 10. Viewing the erratic behavior of monsoon observed during recent years in the region, how comparable the data between 4 years vs. 2 years of observation is? Couple of spelling mistakes needs to be corrected, e.g. p. 1755 (line 27) and p. 1756 (line 10). Figures need to be clearer, i.e. the fill patterns and lines are difficult to differentiate. In its present format, My overall recommendation is to accept with major revisions.

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Interactive comment on Atmos. Chem. Phys. Discuss., 11, 1749, 2011.

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