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Interactive comment on “Aerosol optical properties and radiative forcing in the high Himalaya based on measurements at the Nepal Climate Observatory – pyramid site (5100 m a.s.l.)” by S. Marcq et al.

S. Marcq et al.

laj@lgge.obs.ujf-grenoble.fr

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Reviewer # 1

General: This paper presents an analysis on aerosol optical properties and resulting direct radiative forcing at a high-altitude site located in Himalaya. The paper is original, well structured and clearly written. I have a few minor suggestions for improvements, after which the paper can be accepted for publication in ACP. Comments: 1. The authors correctly point out the uncertainties related to i) the relative humidity depen-

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dencies of the scattering and absorption coefficients and ii) unknown mass absorption efficiency needed to calculate the value of the absorption coefficient. How do these uncertainties affect the value of the single scattering albedo and corresponding uncertainties in radiative forcing calculations. Please discuss shortly in the paper.

Answer: This was indeed not well explained in the previous version and it is basically the same comment made by Reviewer #3. We now have made changes accordingly to clarify that we are referring to dry single scattering albedo in text, figures and tables. Both absorption and scattering coeff. are measured dry due to heating in the nephelometer on one side and to the hydrophobicity of BC on the other. As mentioned in section 5, the effect of relative humidity is however accounted for in the GAME code for calculation of radiative forcing and the calculation methodology is clearly indicated. Concerning the mass absorption coefficient, we now only refer to Decasari et al (2010) and Marinoni et al. (2010) where comparison between EC and BC is discussed.

2. The definition of special events (SE) remains a bit vague. The authors mention that SE are related to long-range transportation, yet it seems that SE are simply some sort of high-concentration cases selected by the criteria not explained here. Please be more specific. answer: We have now added more quantifiable criteria for the definition of SEs

3. The SMPS is mentioned on page 5638 (line 16) and some data are given in Table 1. Yet, SMPS is not described in section 2, nor is a reference given where the instrument has been described. Answer: We now refer to Villani et al., 2006 paper where the SMPS is described.

Technical comments: p. 5631, line 27: Can BC concentration measured as ppb? answer: Yes, we have added the specification “by weight” to make it clear.

p. 5633, lines 19 and 21: Please define the meaning of NCO-P explicitly here when mentioned for the first time. Corrected

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p. 5634, line 5: this figure is missing from the manuscript. Corrected : this was a figure from the previous version but we believe the information is contained in Bonasoni et al. (2010).

p. 5641, line 12: less 5 Mm? Corrected

It seems that figure captions are missing from the manuscript. This was an editing problem

Finally, I would recommend that the figures will be presented in the roughly same format. Figure 4 has been changed into the same format as Figure 2 and 3.

Interactive comment on *Atmos. Chem. Phys. Discuss.*, 10, 5627, 2010.

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