

***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.***

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Reviewer # 2: A. Petzold (Referee)

GENERAL REMARKS The manuscript presents important data on aerosol optical properties and radiative effects for one of the most climate sensitive regions of the Earth. The presented analysis is based on a 3-year record of data on aerosol scattering, aerosol absorption, and particle number size distribution accompanied by measurements of aerosol optical thickness using a sun photometer. The data are sorted

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with respect to different conditions for pre-monsoon, monsoon and post-monsoon events. Air mass origin is tracked by a trajectory cluster analysis identifying three main source regions. Additionally, events are separated according to pollution situations. From this important data set the authors calculate the aerosol radiative forcing for the different air masses and pollution situations. The manuscript is of high relevance and clearly written. Minor comments refer basically to technical corrections.

SPECIFIC COMMENTS Text Page 5633, line 1: Please check the word “anthropized”; it may read “populated”. This was changed

Page 5634, line 13: Please avoid “very complete”; delete “very”. This is now changed

Page 5641, line 1: I propose to write the number 2 as a word, i.e., “show two distinct”. This is now changed

Page 5646, last line, same as above; change to “considered two cases”. This is now changed

Page 5648, line 3: change to 3.5K/day. This is now changed

References Replace reference Petzold et al., 2002 by Petzold, A. and M. Schönlinner, 2004: Multi-angle absorption photometry – a new method for the measurement of aerosol light absorption and atmospheric black carbon, *J. Aerosol Sci.*, 35, 421-441. This is now changed

Check reference Clarke, A.D.; it is referenced in the text as Clarke, 1988 while reference list says Clarke, 1989. This is now changed

Tables and Figures Table 1: Please use a consistent terminology in the manuscript, either  $\sigma_{\text{scat}}$ ,  $\sigma_{\text{abs}}$  or  $\sigma_{\text{sp}}$ ,  $\sigma_{\text{ap}}$ ; I suggest using the latter one. This is now all consistent in the manuscript All figure captions are missing. This was an editing problem

Figure 1: Please write the months on the x-axis in capital letters. This is done

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Figure 2,3: A legend of the different symbols and lines is missing This is now appearing in the Figure caption

Figure 4: I kindly request to add error bars to the SSA data points. This is done after reformatting Figure 4 (see comment of review 1)

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