Atmos. Chem. Phys. Discuss., 10, C7189–C7191, 2010
www.atmos-chem-phys-discuss.net/10/C7189/2010/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Suppression of warm rain by aerosols in rain-shadow areas of India" *by* M. Konwar et al.

Anonymous Referee #2

Received and published: 2 September 2010

Review on "Suppression of warm rain by aerosols in rain-shadow areas of India" by Konwar et al.

The paper deals with the question of how aerosol affects precipitation over the rain shadow area in central India. They use in-situ measurements collected during the Cloud Aerosol Interaction and Precipitation Enhancement Experiment (CAIPEEX) to show aerosol effects on the clouds' properties.

The topic of the paper is important and interesting and the data looks of high value. However the quality of the presentation and the way the paper is organized are not meeting the same standards of the data.

As a non native English speaker I could hardly follow the story of the paper so a general

editing should be done. The authors miss important details about the analysis results on one hand and derive many conclusions that are not linked to what they show in the analysis on the other hand.

For example they discuss in the abstract two aerosol effects that are not clearly shown in the data namely 1) they write "This might invigorate the very deep clouds on expense of the smaller clouds. " And they further discuss invigoration in other places in the paper but nowhere invigoration is shown or hinted by the analyzed data. 2) They discuss in the abstract as well as in other places aerosol radiative effects but show very little evidence to it in the analysis.

My recommendations are: 1) Focus only on aerosol effects on droplets evolution (microphysical effect) hence warm rain suppression. 2) Convince better that the shown differences between clouds are mostly aerosol effect (and not different environmental conditions represented by different profiles over several locations and measurement times). This can be done by testing meteorological parameters (other than CAPE) to convince that apart from aerosols loading all the other environmental conditions are similar. 3) Reduce the discussion on invigoration and absorption or show clear evidence related to these processes in your data analysis.

Specific comments related to the figures (and to the related text):

Fig 1: In the figure you simply show the southern part of India with no other additional information. It would be informative to highlight the location of the Western Ghats, the rain shadow area, the general circulation there (during the data collection time) and the measurement location in a clearer way.

Fig 2: 1) Please explain what is the meaning of measuring more ccns than aerosols. 2) Also, it would be more informative if all figures would have the same scale. 3) The thermal profiles are shown to follow the wet-adiabatic lapse rate apart from the stable parts. Given that the RH is lower than SS for all the profiles, how should we guess where the clouds are? There should be clear evidence in the figure for the clouds

location based on the presented parameters.

Fig 3: It is hard to take home messages from such scatter plot. The author should test the correlations with other meteorological parameters to make the point that the effect is due to aerosol.

Fig 4: The LWC units are not clear

Fig 5. Would help to tie the different profiles to their aerosol loading in one plot

---

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 17009, 2010.