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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Aerosol liquid water content in the moist southern West African monsoon layer and its radiative impact" *by* Konrad Deetz et al.

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Answer to Referee #2b Konrad Deetz 23 July 2018

Dear Referee (Atmospheric Chemistry and Physics),

thank you for your supplementary report from 10 July 2018. We have accounted for the additional comment in the revised manuscript version. Please find our reply (marked with #) in the following.

Sincerely, Konrad Deetz on behalf of all coauthors

Referee comments: (1) It's not clear if the radiative effect of the ALWC is calculated

only from an increase of the aerosol size or if the refractive index is changing with the water uptake ?

We see your point. We suggest that the radiative effect of the ALWC is a combination of effects from the aerosol size increase and the change in the refractive index. Both effects are considered in COSMO-ART but in the model output we do not disentangle them. Although, this is an interesting aspect, it is beyond the scope of our study, which aims on the general quantification of the impact of ALWC on the radiative transfer. To account for your remark, we added the following paragraph in the conclusion section: "It is expected, that the radiative effect of the ALWC is determined by a combination of the aerosol size increase and the corresponding change of the refractive index. Although it would be interesting to assess the contribution of each process, this is beyond the scope of this work and has to be left for future studies."

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