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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Turbulent dispersion in cloud-topped boundary layers" *by* R. A. Verzijlbergh et al.

R. A. Verzijlbergh et al.

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We thank the reviewer for his/her comments, an will treat them point by point.

ad 1 In the definition of the boundary layer as we used it, the ABL includes both the sub-cloud layer as well as the cloud layer. We have clarified the revised manuscript with a more precise introduction of z_i in the methodology section.

ad 2 The correlation function depends only on tau, not on t. We averaged over all particles at all times to obtain an correlation function, although we do not expect much evolution of R in time anyway, given the steady state of the 4 cases. We have clarified this in the revised manuscript.

ad 3 Figure 3 is a projection, i.e. an horizontally integrated profile, of the concentration

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as a function of height and time. We have clarified this in the revised manuscript.

ad 4 We have removed the word ‘looks’

ad 5 .The fact that fig 3 describes a composite of cloudy and environmental properties has been made more explicit in this section.

ad 6 We have changed Eq. 12, and have altered Fig.14 accordingly.

ad 7-10 Level annotations have been added where appropriate.

ad 11 We are unsure which figure the referee means here specifically. However, we have emphasized in the revised manuscript that in the cumulus case, statistics are calculated over cloudy and clear regions, unless specified otherwise.

ad 12 Level annotations have been added where appropriate. The figure shows the complete cloud-environment system.

ad 13 The distance to the nearest cloud edge is meant here; this notion has been added to the paragraph and to the caption. The figure was made for the cloud layer. As was shown by Jonker, Heus and Sullivan (GRL, 2008), almost all points within the cloud layer are less than 1500m away from the nearest cloud, meaning that nearly all points in the layer are included in this figure.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 19637, 2008.