**Atmospheric
Chemistry
and Physics
Discussions**

# *Interactive comment on* "Southeast Pacific stratocumulus clouds, precipitation and boundary layer structure sampled along 20 S during VOCALS-REx" *by* C. S. Bretherton et al.

**Anonymous Referee #2**

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The authors present the general structure of stratocumulus cloud-topped boundary layer and lower free troposphere along $20°$ S using observations taken during VOCALS-Rex. Their analyses include examinations of the observed thermodynamic and wind variations, cloud microphysical properties and radiative fluxes. They conduct trajectory analysis to interpret the observations. The authors are particularly good at integrating various observations to provide a coherent view of the MBL with regard to interactions among MBL turbulence, large- and meso-scale meteorology, cloud-aerosol microphysics and radiation. This is a very informative paper and should be published in ACP.

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I only have following minor comments.

Page 7, line 16. Why is 0.5 gkg-1 used for the decoupling? Does this definition result in similar results as those used in following sections, for example, LCL-cloud base difference?

Page 8, line 24. It would be better to plot potential temperature instead of temperature? After all, it is potential temperature, not temperature, which determines the stability.

Page 9, line 10. SST is still seen increasing moderately westward by about $1°$ C from $75°$ W to $85°$ W. This decrease should also contribute to the overall MBL stability and the westward increase of the MBL heights.

Page 10, line 5. I am not totally convinced that the moist air is due to the mixing with the boundary layer (BL) air over the west slope of the Andes. The BL over the slope must be very dry. Is it possible that the moist air above the inversion near the coast may come from the northwesterly flow just above the MBL, which may originate near the equator?

Page 14, line 18. I have a bit difficulty in understanding the boxplots in several figures. Although I eventually figured out the meaning, many readers may have similar difficulty. Could you simply denote the mean, the first and third quartile in one of the plots?

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 15921, 2010.