

Interactive comment on “Physics of Stratocumulus Top (POST): turbulence characteristics” by I. Jen-La Plante et al.

Anonymous Referee #2

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Summary:

This paper analyses turbulence characteristics near the stratocumulus cloud top from aircraft observations in the POST campaign. The authors previous study developed a method to decompose the entrainment interfacial layer (EIL) into two sublayers, and tested it on two POST research flights. The present paper extends this analysis to six further research flights. Whilst this increases the robustness of the previous results, I am unsure whether that fact alone makes this study worthy of publication. Therefore I feel the authors either need to do some further analysis, or a better job of highlighting what exactly is novel about the current paper, before it can be considered suitable for publication. I have added some thoughts / ideas below.

Specific points:

C1

The previous study (Malinowski et al 2013) considered two contrasting profiles as examples of possible stratocumulus states. I don't see the justification for choosing the additional six that were used here. How were these flights chosen? Were they the ones the method worked best for? If so it would be useful to document the flights where the method didn't work and reasons for this. Are these two sublayers universal features of stratocumulus cloud tops, or only present under certain circumstances? Why not use all POST flights, to give a much larger sample size and allow a more statistical analysis of the results?

It would be interesting to show on Table 1 the total number of cloud top penetrations in that flight, to see how frequently the method is diagnosing these layers. What happens on T007, where it looks like you diagnose layers on less than one-third of the cloud top penetrations? It would also be interesting to have some discussion of the difference between numbers in TISL and CTMSL diagnoses, i.e. what is happening when one is found but not the other?

One of the clearest reasons (to me) for considering these two sublayers came from the difference in the Corrsin and Ozmidov scales in the two sub-layers, yet very little is made of this result and could perhaps be expanded upon. What does the much larger, and more varied, lengthscales in the CTMSL tell you about that region of the cloud top?

All the plots could be bigger and clearer.

Minor/typo:

L31 - should say "aims" instead of "aimed"

L33 - I'd suggest removing "the"

L88 - I'd suggest defining "porpoising" the first time you use it, for readers who may be unfamiliar with the term

L91 - Gerber et al shouldn't be in brackets

C2

L125 - Perhaps say where Monterey Bay is for readers who may not know

L146 - should say "cloud" instead of "clod"

L177 - I'd suggest adding a comma after "wind shear"

L199 - should be 17-58 cloud top penetrations

L456/482 - the 10^{power} is a bit messed up

L554 - should say "mind" instead of "find"

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2015-950, 2016.