

Interactive comment on “Wind speed response of marine non-precipitating stratocumulus clouds over a diurnal cycle in cloud-system resolving simulations” by J. Kazil et al.

Anonymous Referee #2

Received and published: 8 December 2015

General Comments

This is a thorough and well presented set of experiments on a significant topic of current interest. The authors did a good job of analyzing the results and identifying and explaining the physical mechanisms involved.

As it stands, the experiment captures only a 24-hour cycle. It would strengthen the study if a few of the experiments were performed for a longer integration - a few days or more - as there may be some further equilibration behavior on time-scales of a day or longer (e.g. Jones et al. 2014) that may be important to capture in order to make the results more applicable to a broader set of stratocumulus boundary layer environments.

C10262

I don't think this extension is necessary for publication however.

Otherwise I have only a few minor suggestions.

Specific Comments

p. 28405 line 26: 'misses the observed cloud water' instead of 'misses the observations' would be better.

p. 29407 line 20 It would be clearer if 'identical' was replaced with 'otherwise identical' and if 'from the latter' were 'from L-,0,+'

Figures 1,3,4,6,and C1: The subfigure letters should be closer to the boxes that they are labeling.

Given the caveat that this is only a simulation of specific transient case in a specific region, could you make any statements or comments in the last paragraph of the conclusions about the sensitivity of CRE to windspeed shown here? Is the amplitude of the CRE response significant?

p. 28406 Discussion in last paragraph: Including sedimentation of cloud droplets (but not precipitation droplets) might allow a more realistic aspect ratio to be used by reducing mixing at the inversion. This is just a suggestion for potential future follow on simulations.

Technical Corrections

p. 28938 line 15 should be 'additional'

p. 28399 line 23 should be 'Atlantic'

p. 28411 line 17 'lead' should be 'led'

p. 28431 line 18 should be 'transport' and probably better to use 'stronger' instead of 'faster'

p. 28432 lines 4/5 should refer to figure C1, not C2

C10263

References:

Jones, C. R., Bretherton, C. S., and Blossey, P. N. : Fast stratocumulus time scale in mixed layer model and large eddy simulation. *J. Adv. Model. Earth Syst.*, 6, 206-222, doi:10.1002/2013MS000289, 2014.

Interactive comment on *Atmos. Chem. Phys. Discuss.*, 15, 28395, 2015.

C10264