

## ***Interactive comment on “Direct entrainment and detrainment rate distributions of individual shallow cumulus clouds in an LES” by J. T. Dawe and P. H. Austin***

**Anonymous Referee #2**

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This is a highly original and well thought-out paper. I enjoyed very much reading the paper and believe the results will be very valuable to the cumulus dynamics community. I only have a few small comments that I hope will be of use to the authors.

In figs. 6 and 8, the authors show the mean values of  $\log(\epsilon)$  and  $\log(d)$ . What's the physical meaning of the mean of the logarithm of fractional entrainment and detrainment rates? In the text, these were referred to as the PDFs (or histograms) so I'm a little confused about what they are.

In the discussion of the relationship between the circumference and area, are the differences between the correlation coefficients significant? You have got 0.928, 0.913

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and 0.925. Can one use such small differences to reject one relationship in favor of the other?

In a couple places (beginning of section 4 and end of section 5), the authors stated that parameterizations should outperform the statistical results. It would be useful to elaborate on this, particularly because this analysis focuses on the mass exchange, which is not directly applicable to parameterizations as the authors have noted in the paper. Which aspects of the statistical results are the parameterizations supposed to outperform?

Pg 5385, line 7, “and” not “an”

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