

### General comments:

The entire paper is well written, cites relevant references, and has in my opinion a very nice balance between presenting strong results and being self-critical about them. The introduction gives a clear motivation for the work and realistic expectations on what the reader can expect. The remainder of the paper is clearly structured and easy to follow. There is an extensive discussion, which is highly interesting. The implications for modelling on any scale (aside from our theoretical understanding of convection), from LES to global climate are substantial. This work connects (rather difficult) theory with practical implications and should be of great interest to the weather and climate community. I can recommend to publish this work and only have a few ideas for improving it further, which I list below.

### Specific comments:

- 1) The model setup misses a description of how boundaries are treated
- 2) The caption of Fig. 1 mentions “this Section (Section 2.3)”, but the figure is first referred to in Section 2.2. At this point I was not able to understand the figure. In the end I still struggle. Could this figure be improved so that it better explains the different ensembles and the logic? That could be achieved perhaps by naming the relevant sections in the figure. Or by a table, which could have a column with comments like: “to test this and that” ..., “same as experiment XY but with modified XZ”
- 3) L383 and 400: how can we distinguish the first and second time interval? I understood that Fig. 5 uses the same symbols for both. I was wondering if that is bad. Can the authors comment on it?
- 4) The other comment that I was waiting for is the apparent leveling off at constant divergence in Fig. 5 at the highest heating rates. What is the interpretation?
- 5) L404: “Mass divergence of the outflow cannot originate from a point outside of the convective cell’s updraft itself”: I don’t understand what the authors mean by this. What physical process does this reflect and what other possibility would there be? Also: the compensation of neighboring cells was discussed. Is this sentence not a contradiction?

### Technical comments – or very minor

- 1) Fig. 3: what does white color mean?
- 2) L274-275: I do not understand this sentence: “The box size over which outflow is diagnosed has to be sufficiently as a result of that shortwave pattern.” Sufficiently what?
- 3) L278: what could cause the boundary effects?
- 4) Generally: the units are not correctly formatted, neither in the text nor in figures.
- 5) L87: reference format
- 6) L89: suggest “occurs” -> exists