

Interactive comment on “Characteristics of gravity waves generated in a baroclinic instability simulation” by Y.-H. Kim et al.

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The authors thank the referee #3 for his/her valuable comments. We add several statements regarding the points the referee commented on. The responses to each of the referee's comments are listed below.

Main points:

1. The text may be a bit long. Sometimes, the figures are discussed in perhaps too much detail. On the other hand, the precise and careful description of all the figures and of the approach contributes to avoid confusions and to make sure that the different points that have been analyzed are well understood. The authors may try to reduce the text a little.

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> We tried our best to reduce the text in the revised manuscript. However, the text becomes even longer during the revision process, mainly due to the addition of Fig. 3.

2. It is very good to test the relevance of the frontogenesis function (FF). The tests are not encouraging, which is not so surprising as the FF was proposed as an indicator of gravity wave generation on heuristic arguments, not from theoretical arguments. This part of the study is not included in the summary (section 5). A firmer conclusion on this topic could be included, such as 'Investigation of the relation between gravity waves and the frontogenesis function did not reveal any systematic relation between the two. Using the FF in parameterizations certainly provides a rough indication of regions where fronts are developing, thereby introducing intermittency in the sources, but the present simulations do not provide any evidence for a quantitative or even a precise spatial relation between the two.'

> The conclusion regarding FF is included in Summary in the revised manuscript [L5–11, P24].

Minor points:

p32648: line 6: is -> are ?

> It is corrected as pointed out [L8, P10].

p32652: line 16–19: an important reason may be that the present baroclinic life cycle emphasizes tropospheric processes near the ground (as recalled on p32655, lines 28–29 and onwards), rather than upper-level jet processes. This is closer to the anticyclonic run of PS07, which also had longer vertical wavelengths (especially as resolution increased).

> We agree. The statement regarding this point is added in the revised manuscript [L16–19, P14].

p32661: It would be good to recall, here in the summary, the point above, ie that the present life cycle differs from previous ones in that it emphasizes surface processes.



> A statement is added to recall this point in Summary in the revised manuscript [L26, P22–L2, P23].

ACPD

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