Geoscientific
Model Development
Discussions

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Interactive comment on "Verification of a non-hydrostatic dynamical core using horizontally spectral element vertically finite difference method: 2-D aspects" *by* S.-J. Choi et al.

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1. Referee 2 previously asked:

"it would be interesting to evaluate the maximum vertical velocities generated by the model in a long-time simulation of a resting atmosphere above orography."

It appears that you misunderstood this comment. The referee was asking for results of a test case such as those described by:

Klemp, 2011, MWR 139:2163-2169 or those presented in fig 5 of: Botta, Klein, Lan-

genberg and Lutzenkirchen, 2004, JCP 196:539-565

These are certainly something that you should consider however you may not have time at this late stage in the review process.

2. There was also a point that I failed to pick up on before but your convergence with resolution results drew my attention to it. Despite using 8th-order discretisation in the horizontal, your numerical results converge with 2nd-order accuracy due to the lower order finite differences that you use in the vertical. This should be pointed out in the abstract. However I would imagine that your scheme is formally 1st-order accurate on a grid with non-uniform spacing in the z direction since you use centred finite differences in the vertical. You should point this out. You may also wish to consider doing your convergence with resolution test case with non-uniform spacing in the vertical. However, again, there may not be time for this at this late stage in the review process.

Interactive comment on Geosci. Model Dev. Discuss., 7, 3717, 2014.