

1 **Reply to Editor**

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3 I appreciate your continued comments to improve the manuscript. I revised the
4 manuscript with following the responses.

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6 *On page 10, lines 12-14 you say:*

7 *"We validated the 2D NH model with five test cases: linear hydrostatic mountain wave and*
8 *tracer-advection and gravity-wave tests over Schär Mountain, as well as density current,*
9 *inertia–gravity wave, and rising thermal bubble experiments."*

10 *That sounds like 6 test cases. But what about the resting atmosphere over orography? That*
11 *would make 7.*

12 ⇒ First of all, I dropped the results for a resting atmosphere over orography. I agree with
13 your opinion and criticism and I feel the need of a further study about that. Therefore
14 it is right that we conducted all six test cases. We revised accordingly.

15
16 *I would recommend removing these results from the paper and making a comment that,*
17 *achieving stable results for a resting atmosphere over steep orography with minimal diffusion*
18 *will be future work.*

19 ⇒ Following your suggestion, the sentences were revised for future works accordingly.

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21 *At the top of page 16 you discuss the difference between the 5th and 8th order basis*
22 *polynomials for the cold bubble test case. You still insist that the 8th order basis polynomials*
23 *give better results but from the results that you present, this is not the case. The results in*
24 *figures 7 and 8 are extremely similar. The results in figures 9 and 10 confirm that the results*
25 *for 5th and 8th order are extremely similar. I agree that on figure 9 and 10 I can see some*

26 *very small differences. But these seem so small that you cannot possibly suggest that 8th*
27 *order is beneficial.*

28 ⇒ Following your suggestion, the discussions about the difference between the 5th and
29 8th order basis polynomials for the cold bubble test case were revised. And the figure
30 for the distributions of 8th order experiments was removed.

31

32 *Having re-read the paper and the conclusions I would say that the conclusion:*

33 *"The numerical results showed that the present dynamical core is able to produce high-*
34 *quality solutions comparable to other published solutions." is not proved. I would say that a*
35 *more accurate statement is:*

36 *"By varying the viscosity between test cases, the numerical results showed that the present*
37 *dynamical core is able to produce high-quality solutions comparable to other published*
38 *solutions."*

39 ⇒ The conclusion was changed with your words.

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