

Following the point-by-point responses that we published before, we revised the manuscript. Here relevant changes made in the manuscript are listed simply.

For Editor's comments

1. We added new section for the two additional experiments (1.the tracer advection over the mountain of Schär et al. (2002) and 2. Schär Mountain gravity wave).

2. The auxiliary figure that you mentioned in C1349 was obtained in Schär Mountain gravity wave. I acknowledge my misunderstanding. The maximum vertical velocity in a long-time simulation of a resting atmosphere above orography is not included in the manuscript.

3. The need to implement diffusion on physical surfaces is mentioned in future work.

4. The comments about the 2nd-order accuracy were pointed out in the abstract and the text.

For Referee#1 comments

1. We added the two additional experiments (1.the tracer advection over the mountain of Schär et al. (2002) and 2. Schär Mountain gravity wave).

2. The paragraph of “*degrees of freedom (DOF)*” is revised using the term of “total number of GLL grid points in the physical domain”.

3. We made the statement (which is related Fig.6) clear.

4. New section for diffusion was added

For Referee#2 comments

1. The statements about accuracy of the time discretization and relevant filter were added.

2. New table for time-step sizes was added

26 3. New figure for self-convergence was added.

27 4. The revised manuscript was edited by professional English editor.

28 5. The issue about the temperature perturbation in Straka et al. (1993) was addressed.

29 “In this study, the potential temperature perturbation of $\theta_c = -15$ K was adopted for

30 comparison with GR08 and Li et al. (2013). Straka et al. (1993) originally used a -15 K

31 temperature perturbation. The -15 K potential temperature corresponds to -13.53 K

32 temperature.”

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34 6. We removed the term of “perfectly symmetric”

35 7. We removed the text of the bracket which is related to the basis function.

36 8. We changed all figures format.

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