Geoscientific
Model Development
Discussions

Interactive comment on "DCMIP2016: The Splitting Supercell Test Case" *by* Colin M. Zarzycki et al.

Anonymous Referee #1

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1   General comments

The authors present initial conditions and results of an idealized dynamical core test.

The contribution is very welcome and the attention to detail appreciated. Too often are test case descriptions incomplete, which can result in difficulties if not the failure when trying to implement and or reproduce the results.

The Scientific reproducibility was rated as good. It would be excellent if the source datasets (NetCDF files) for the figures were uploaded to, for example, figshare, and cited with their DOI. We would strongly suggest the authors do this.

2   Specific comments

On page 2, lines 15 and 16: It is not clear that it is necessary to add the (1°) and (1km). Rather it would be clearer to write, for example, "... the resolution is $4°/X \approx 440\text{km}/X \approx 4\text{km}$.

On page 2, line 23: maybe rewrite the current "... were required with time between outputs required to be ..." as " were stored for post-processing with a frequency of every 15 min or higher."

Page 3, line 7, 8, and 9: I would suggest to rewrite equation 3 without the $\cos\varphi$ term and hence replace $\bar{u}(\varphi, z)$ with $u_{eq}(z)$ and add to line 4: $u(z, \varphi) = u_{eq}(z)\cos\varphi$. Remove any overbar on U and H. It is not subsequently used, and in this particular case, it is the mean of a constant, and therefore potentially misleading as one might think that there is a zonal variation.

Page 5, line 27: Please add a summary of the results presented to prepare the reader and fill the void in between 3. and 3.1

Page 6, line 18: Maybe "... a notable difference exists through the end of the runs ..." would better read "... a notable difference exists towards the end of the runs ..."? "through" to me would indicate from beginning to end. "This spread in model solution..." potentially has an unclear precedent. Maybe "..., the models start to *diverge* towards the end of the run. This *divergence* ..." without the emphasis, of course, would be more explicit?

3   Technical corrections

Page 15, Figure 5: either replace the "increasing darker" with the actual color names or refer to the legend. I find it difficult to say which color is darker or lighter (except the

black and light pink, naturally).

On page 2, line 22 (and elsewhere in the document): There is no need to state that 120min=7200s. Just say that it is 120min.

Page 7, line 3: As noted above, no need to add the 7200 sec

4 Conclusion

Apart from these minor and mostly technical issues, we would strongly suggest to accept and congratulate the authors for the clear and detailed presentation.

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