

Dear Bob,
We have made the changes you asked for.
Kristofer
PS. Good comments by the way.

- Page 2, line 7: "Their" should be "The" as first word

This has been corrected

- Page 2, line 13: This statement about reversibility of the flow not being possible in RK4 is somewhat mysterious. Are the authors here talking about a fundamental mathematical property of RK4? Because as far as I know the RK4 scheme is commutable under $dt \rightarrow -dt$. Or are they talking about numerical noise and accumulation of round-off errors? Because in that case the statement essentially says that the TRACMASS scheme has no (or far less) numerical noise than RK4. I'd like to see evidence for that, if that's what the authors mean.

We have removed "which other trajectory methods, e.g. RK4, can not accomplish."

- Page 3, line 10: I think it would be good if the statement "since it does not satisfy the discretised continuity equation in a GCM" would be a bit more expanded. Why is this the case? Is this easy to derive? if so, please show, or otherwise provide references

We have rephrased and softened this statement somewhat by writing on Page 3, Lines 8-12:

"An alternative approach is to assume that $u = u(x, y, z)$, $v = v(x, y, z)$ and $w = w(x, y, z)$ inside a grid cell, which might be more realistic in terms of representing unresolved motions. However, no such information is generally provided by GCMs. Furthermore, it would also require that the mass transports through the grid faces are unchanged in order to satisfy the continuity equation of the GCM."

and on Page 5, Lines 19-22, we added:

"Note that the calculation of the vertical mass transport $W_{i,j,k}$ through the top face of a grid box, with the Eqs. 12 – 15, only involves the velocities on the considered grid box. A 3D dependency of the velocities ($u = u(x, y, z)$, $v = v(x, y, z)$ and $w = w(x, y, z)$) would require velocities from other grid boxes, which could potentially break the mass conservation of Eqs. 12 – 15."

- Figures 5, 6 and 7 would be easier to comprehend if they have latitude and

longitude ticks. While the Eurasian continent in Fig 7 is probably recognisable to most readers, I doubt whether the Agulhas region in Figures 5 and 6 is so recognisable too. Latitude and Longitude ticks will help readers orientate themselves.

We have updated Figure 5 and 6 with longitudes and latitudes.