Thank you for sharing your research. This paper presents a fourth-order accurate and cost-effective scheme called sweep interpolation, which uses fewer neighboring cells than the cubic interpolation. It significantly reduces computational time while maintaining very close accuracy to the typical fourth-order interpolation. However, there are still some issues that need to be addressed before it can be accepted for publication in GMD.

We greatly appreciate your interest in our work and your valuable and insightful comments. Your comments and suggestions have helped improve the manuscript.

(1) Different interpolation schemes should have different contents. Please compare the differences in contour maps between CUBIC and SWEEP interpolations in Figure 3, Figure 4, and Figure 5.

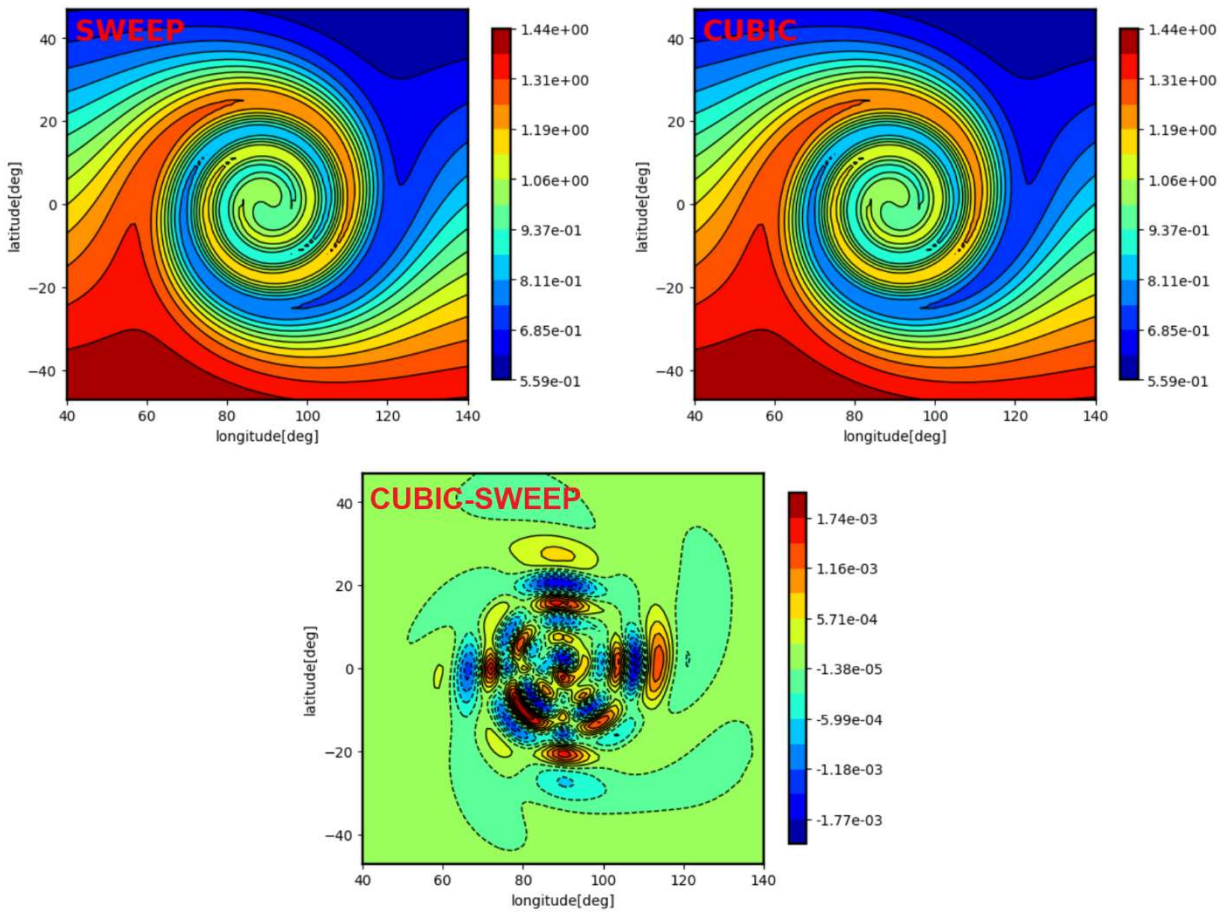
In response to your suggestion to include additional figures to compare the differences between CUBIC and SWEEP interpolations in Figure 3, Figure 4, and Figure 5, we have taken an alternative approach to address this issue. Instead of adding new figures, we have incorporated explanatory text within the paper to highlight the differences between the two interpolation schemes.

On page 7, we have included the following information: "For this case, the normalized infinity norm error ($E_\infty = \frac{\max |cubic - sweep|}{\max |cubic|}$)=0.001."

Page 8 now contains the explanation: "Here, the normalized infinity norm error is $E_\infty = 0.03$."

Page 9: "Here, the normalized infinity norm error is $E_\infty = 0.018$."

For your reference, we added the following figures to show the exact value of the tracers and the difference for the first case:



(2) In the atmospheric methane-like tracer test case, the differences between cubic and sweep interpolations are apparent (Figure 5b), and the reasons for these differences should be analyzed.

In response to your question about the differences between the cubic and sweep interpolations which are seen in Fig.5(b), we have added the following explanation of the sources of these differences:

"Although sweep interpolation was able to better control the mass error growth over the simulation time compared to the cubic interpolation for this case, it is not necessarily expected to perform better in all cases. Based on our discussion in the previous section, we expect sweep interpolation to provide almost the same accuracy as cubic interpolation. This is supported by Fig 5(b), which shows that sweep and cubic interpolations produce mass errors that are of the same order of magnitude. However, since both methods rely on different finite difference approximations, we expect to see differences in the evolutions of their respective error trends, which is confirmed by the results of Fig. 5(b)."

(3) Serial numbers are not marked in Figures 4 and 5.

Thanks for the comment. We have fixed the problem.

(4) Place all the pictures on one page in Figures 4 and 6.

In response to your request to place all the pictures on one page in Figures 4 and 6, we have removed the subfigure corresponding to the South Pole region from Fig6 and organized the remaining figures into two rows of 3 figures each for better consistency and presentation.

This modification aligns with your suggestion, and we believe it enhances the overall clarity and readability of our figures.