**Response to reviewer 3: (MWR-D-11-00367)**

Thank you for your helpful comments. We have revised the paper in response to your comments as follows:

**Major Comments:**

1. The time step of the IAP simulations

According to your suggestion, we have rerun the IAP model with 1200s time step for the parameterizations. We found that the new results are largely the same the same as the original results of using 600s time step and our conclusions remain the same. We have re-plotted all related figures in the revised paper by using the new simulation results to follow your suggestion.

1. The KE and EKE spectra

After discussions with Dave Williamson at NCAR, we followed the calculation procedure he used in the appendix of Jakob, R., Hack, J.J., Williamson, D.L. (1993, Solutions to the Shallow Water Test Set Using the Spectral Transform Method. NCAR TN-388+STR)  and we obtained the distribution of spectra that are similar to the published results in the book you mentioned. We have added Figure 6 in the revised paper to include the energy spectra and a paragraph at the end of page 15 to discuss the differences between the models. The spectra also indicated that the different horizontal diffusion schemes are not the major reason for the weaker eddies in the IAP model. While our calculated spectra are similar in most wavenumbers to the plots in the book chapters that you mentioned, we could not get the small uptick feature near the highest truncated wavenumber in these plots near the 2x(deltaX) wave lenghth. We are unable to reproduce this uptick feature in our calculation. We are still discussing this with Dave Williamson about possible causes of the difference and will continue to investigate this issue. We think that this should not affect the results of the paper.

1. The words “same resolution” have been eliminated throughout the paper in the revision.

**Minor points:**

1. We added the description of spectra versus grid point of the two models on lines 9-12, Page 3 in the revised paper.
2. Yes, both dynamical cores of IAP model and CAM spectral model use the traditional methods. We modified the sentences to make it clear.
3. ‘shap-preserving’ is corrected to ‘shape-preserving’.