Review comments on "Source apportionment of atmospheric water over East Asia – a source tracer study in CAM5.1" by Pan et al.

This study uses CAM5.1 to identify the sources of moisture contributing to the precipitation in East Asia. Both approach and results are interesting. The manuscript may be accepted for publication in GMD after major revision. Specific comments are listed below.

Major comments:
I.   Diagnostics part:
   1.   It is clear how the simulation were conducted. The simulation were conducted from 1997-2007. It is said in line 284 that "…CAM5.1 is driven by MERRA data …". Obviously, it was not an AMIP-type experiment. Please provide clear discussion the simulation procedure and how the MERRA data were applied to drive CAM5.1. Also what does "offline version of CAM5.1" mean?
   2.   In addition to comparing the simulated precipitation with GPCC, a comparison of simulated water substances and convective/stratiform precipitation with satellite observation could be useful and informative. Also, assessments on other parts of water cycle, such as the evaporation, surface water storage, and their seasonal cycles (e.g. Numaguti 1999) should also be checked. The bias of model simulated large-scale circulation and their possible impacts on the results should also be discussed.
   3.   In the simulation, WNP contribution in terms of percentage to YRV precipitation was the largest in cool season. This is not obvious when looking at long-term mean water moisture flux shown in Figure 3. The contribution is likely associated with the synoptic disturbances that could bring moisture from south. The authors may need to provide their views somewhere in the text. Moisture transport is likely contributed by a large portion by synoptic disturbances. But the manuscript tends to discuss the related dynamics based only on long-term mean water vapor flux.
   4.   Contribution from each region is difficult to distinguish in the bar charts shown in Figure 6-8. Could authors re-plot bar charts by stacking all regions according to their region number (e.g., 1 to 25 from bottom to top) and present a schematic showing the stacking scheme?

II.   Tagged AWTs

1. The approaches for adding tagged water vapor and qc and qi within individual physical parameterizations need more detailed description in section 2, especially for the macrophysics and microphysics schemes. For example in macrophysics, I does not quite understand how the tagging of those microphysical, advection, and convective tendency from other processes in solving Park's matrix in the macrophysics was done. Similarly, details for those complicated microphysical processes were not discussed. Also, snow and rain (important sink of tagged water) were diagnostically determined in the microphysics of CAM5.1 version. Snow and rain are important sinks of tagged water. However, no discussion on these two hydrometeors was provided.

2. How were the detrained qc and qi from deep and shallow convection schemes tagged and put into macrophysics?

3. How was the adjustment exactly done when the sum of tendencies of all tagged water substances was not equal to the tendency of the corresponding original substance? How big the adjustment can be? Would the results be quite different if no adjustment were done?

4. In CAM5, evaporation of convective rainfall is assumed to be as Sunqvist (1988), which is proportional to the square root of the total rainwater flux at each level. Therefore, the linear partitioning of evaporation based on precipitation flux of tagged water (eq.2) does not seem to be consistent with the formulation used in the model.

5. Some of the formulation of tagged water substance in the macrophysics are confusing, especially for the cloud fraction. How can the stratus cloud fraction be composed proportionally of each tagged condensates without mixing?

Minor comments:
1. It is "Neale et al." rather than "Neal et al." in the text (line 99).
2. It is "Gettelman" rather than "Gettleman" in the text (line 189, 190, 196).
3. It is not clear what Figure S7-S10 exactly show. To where and what the vapour tracers supplied from 25 source regions contribute?