Interactive comments on "Analysis of CO in the tropical troposphere using Aura satellite data and GEOS-Chem model: Insights into transport characteristics of the GEOS meteorological products"

This manuscript provides a comprehensive and in-depth evaluation of the CO simulations by GEOS-4 and GEOS-5 in the tropics and underlying causes of the model errors. The authors used a variety of approaches to uncover how errors in convective transport, large-scale winds and in emission of CO and related chemical species contribute to the discrepancies of seasonal change of CO between models and observations, to test how sensitive is their results to the assumptions they used in comparing model outputs and satellite observations. While the manuscript appears to be long and hard to follow when I first read it, the main points are clear once I complete my reading. Thus, I recommend accepting the manuscript for publication with minor revision, focusing on making the manuscript more concise.

Below are my minor comments:

1. P19637, lines 15-16: South America was much dry in 2005 than in 2006. This is mainly due to warmer sea surface temperature (SST) in north tropical Atlantic (see Marengo et al. 2008, J. Climate, Zeng et al. 2008, Envir. Res. Let), not due to a La Nina in 2005.

   Similarly, on P19646, lines 13: An El Nino tends to suppress convection and induce an anomalous subsidence over Amazon. The stronger vertical mixing in 2006 compared to 2005, is probably due to weaker convection in 2005 caused by warmer SST in north tropical Atlantic.

2. Figures 3, 4, 5 and 6: there are too many panels in these figures so it is difficult to see them clearly. I suggest dropping a half of the panels since they are not discussed in the paper, and also label the month of each panel.

3. Fig. 8: Since the four panels in the right column are not discussed until after discussion of Fig. 12, I suggest to name these four panels as Fig. 13.

4. Because there are so many figures and so much detailed discussion for each region in Section 5, I suggest adding a brief summary at the end of discussion for each region to help reader see your main points before they reach the conclusion section.

5. Section 5.4: Could you explain why CO over Indonesia is similar between a non-El Nino (2005) and an El Nino (2006) year over Indonesia in Fig. 25?