Dear author,

Thank you for your revised manuscript and answers to the referee's questions and comments. They are quite complete but I consider that some revisions are still needed.

My main concern relates to the issue #35 (referee 2) which is also linked to issue #5 (referee 1). In fact, I do not really understand your replies to these two important issues and I understand that you did not make any modifications in the document to address them. Thank you in advance for a revised version of the document taking into account these issues.

I also have the following additional remarks:

- #6: IPCC, AR4, GFDL, CM3, NOAA, PE, GFDL, CPU are still not defined
- #25 - #26. :
  - I think the reviewer was not asking to add land temperatures to Fig 5 and 6 but just add an extra plot similar to Fig.5 and 6 for land temperatures. Is that possible?
  - Fig. 6 captions do not read OK to me now. Please add "(a)." after "CERES EBAF v2.8 climatological top-of-atmosphere radiation budget " and change ", and (b) Model ..." for "Panel (b) shows model ..."
- #23, p.9, l.23: I am not sure I understand your "PE/PElist" concept, as you are mixing hardware (core) and software (communicator) concepts. If a PElist is equivalent to the communicator concept in MPI, you refer here to the software concept that I would call a list of MPI tasks. But then in Table 1 legend, you write "NPES is the total PE count (MPI*OMP)" so it looks like there is no equivalence between a PE and an MPI task. If two processes share one core (multitasking), would you have two PEs (two processes) or only one PE (one core) in your PElist? Can you clarify?
- #36 I think the new numbering of the component timesteps in the top panel of Fig. 1 is wrong and the previous was right. Eq. (1) states that $A^{t+1}=f(A^t,O^t)$, and $O^{t+1}=f(O^t, A^{t+1})$. The top panel of Fig. 1 would imply $A^{t+1}=f(A^t,O^{t+1})$ and $O^{t+1}=f(A^t,O^t)$.
- #49.: I understand your argument about differences probably vanishing with tuning, but as referee 2, I still think that the results that are counter intuitive and this should be stated. Also the sentence "Although this difference is small we feel it is robust and likely related to a sensitivity to the radiative time step discussed below. " seems contradictory to me. If they are robust, they would not vanish with tuning?
- Fig.3 and associated text: even if the captions help understand the FMS architecture, I still agree with the referees that some aspects are misleading.
  - First, I would remove the green openMP box and the dark blue MPI box on the figure (as the meaning of the colours is now clearly explained in the text.
  - Second, for coherency, I would replace "Atmos Down" by "atmosphere-down" and "Atmos Up" by "atmosphere-up" in the figure, or put "(Atmos Down)" after "atmosphere-down" and "(Atmos Up)" after "atmosphere-up" when they appear in the text.
  - In the text, you write "The implicit coupling requires … (land and ocean) ..." but I understand that FMS implements the implicit coupling only over the land and not over the ocean. Can you clarify this?

Finally, I have the following additional minor comments:

- p.2, l.13 please change "... assessments, and their complexity (the number of feedbacks and phenomena simulated), exhibits ..." for "... assessments and their complexity (the number of feedbacks and phenomena simulated) exhibit ..."

- p.2, l.14 please change “Figure 1.2[1] Figure 1.4[2] “ for “Figure 1.2[1] and Figure 1.4[2] “
- p.3, l.2: please change “operatorss” for “operators”
- p.3, l.2: why do you qualify “operators and operands” as “new”?
- p.3, l.3: please change “... and locality and reuse hard to achieve.” for “... and locality and reuse are hard to achieve.”
- p.3, l.23: please move “(temporal subsampling)” right after “coarser timestep than the rest of the atmosphere”
- p.3, l.25: I do not understand the “as well as the temporal”. Do you mean “as well as in the temporal domain”?
- p.4, l.7: please change “... AMIP (The Atmospheric ...” for “... AMIP (the Atmospheric ...”
- In Table 1 legend, please replace “MPI/OMP” by “MPI*OMP”