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Earth System Dynamics
Discussions
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Interactive comment on "Climate, ocean circulation, and sea level changes under stabilization and overshoot pathways to 1.5 K warming" *by* Jaime B. Palter et al.

Anonymous Referee #1

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Recommendation: Accepted after minor revisions

The present manuscript presents the sensitivity of some relevant parameters: sea level changes, AMOC and global mean temperature assessed in two different scenarios of CO2 emissions (stabilization and overshoot pathways) during the XXI century, both of them reaching the recommended target of 1.5 K of global surface temperature increasing by the year 2100.

The manuscript is very well written, discussed and documented, based on appropriate referenced bibliography. The manuscript shows clearly that, even though the same global temperature is reached, the followed pathway may produce significant differ-

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Discussion paper

ences (e.g. sea level rising and AMOC), leading to scenarios with worst societal impacts than others.

There are only a few points which would be worth to refer.

1 – Authors discuss only AMOC and sea level changes. However, the Earth System model runs have produced much more output namely that concerning the global budgets of water (hydrological cycle) and angular momentum and other surface properties (e.g. precipitation leading to changes in floods and droughts occurrences). The authors may add a few sentences regarding these aspects and quantify significant changes in case they are relevant.

2 – The chosen overshot pathway is not unique. There are maybe more pessimistic ones. In the discussion, the authors may discuss which variations could be considered in the overshot pathway keeping it consistent with the final temperature rising of 1.5K (e.g. initial stage and its end before the CO2 uptaking phase) and what should be the expected impacts.

3 - Line 32, pg. 2 (2°x2.5° lat -long?) Clarify.

4 - Lines 8-9, pg. 3, clarify the type of added SST perturbations in the ensemble members: standard deviation of the perturbations, Gaussian distributed?

5 - Add dz in the integral giving the steric term (Eq. 3).

6 - Line 7, Pg. 7. Acidification is not quantized. Give some numbers clarifying the differences between the stabilization and overshoot pathway scenarios.

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