

Interactive comment on “ISSM-SLPS: geodetically compliant Sea-Level Projection System for the Ice-sheet and Sea-level System Model v4.17” by Eric Larour et al.

Anonymous Referee #2

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The authors developed a new method to account for feedbacks between ice sheets, ocean circulation and solid-Earth deformation through dynamically computed sea-level fingerprints for probabilistic projections of local sea-level change. This is a significant and timely contribution because current probabilistic projections use static fingerprints and cannot readily incorporate advances in forward models. The manuscript is well-structured and provides clear examples of how the SLPS works. However, I think the clarity of the manuscript could be improved with some (minor) modifications of the text and figures, see the comments below.

L4: For long-term projections (...) that provide such probabilistic projections – repeti-

C1

tive, can this be rewritten?

L8: solid-Earth ‘uplift’ – displacement or deformation would be more complete?

L26: why not give examples of the use of projections globally rather than so many references for just the US?

L37 & 118: steric sea-level change is defined incorrectly here, see Gregory et al. (2019). It is the sum of global (not local) thermosteric expansion and ocean dynamics (which include the local steric effect, both thermo- and halosteric) including the IB effect. Can the authors clarify this?

L38 & 55: Not just ESMs but also AOGCMs

L47: Do you mean Kopp et al. (2017) here instead of (2014)?

L64-66: Can the authors comment on the expected importance of geometry changes to 21st century sea-level projections?

L83: ‘results such as (...) results’ - please rewrite

L91: ‘higher-frequency’ higher than what? Perhaps use ‘high-frequency’ instead?

L97-103: this paragraph misses a final sentence placing its content in context of the manuscript

L104-107: this sentence doesn’t read very well, can you please split this up in smaller sentences?

L114-115: ‘and through ... individual sample’ misses a verb, perhaps reverse the order with ‘retaining the ... from Eq. 1’

Figure 3: the axis labels have fallen off the figure

Figure 5: It is very hard to distinguish colors of cells within the mesh, could this be improved by for example adapting the range of the colorbar?

C2

L253: has a typo 'approach'

L291-292: "DSL is not sampled, but rather deterministically set to the DSL term of the CMIP5 NorESM-ME runs" – why? please explain

L299: refers to figure 9 instead of 8, and discussion of Figure 9 is missing?

L316: "inpact"

L343: 'urther'

Interactive comment on Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2020-103>, 2020.