



EGUsphere, referee comment RC3
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Comment on egusphere-2022-101

Anonymous Referee #3

Referee comment on "Modeled storm surge changes in a warmer world: the Last Interglacial" by Paolo Scussolini et al., EGU sphere,
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This manuscript presents simulations of the storm surges at the LIG through combining the climate modeling using CESM1.2 and hydrodynamic modeling using GTSM. The authors' results show spatial heterogeneity in the seasonal LIG sea level extremes, which they attribute to changes in the atmospheric circulation. The implication of the findings on the interpretation of sea-level proxies is also discussed.

The manuscript is very descriptive and does not have many in-depth analyses into the physical processes. I suggest a major revision before considering for publication. Please see details below.

- How was the CESM LIG simulation initialized? How long was the simulation? What criteria was used to determine the simulations are in equilibrium (e.g., Line 98)?
- How well does the authors' modeling approach reproduce the climate and storm surge in the present-day observation? This question is critical, as it provides information about the performance of the authors' approach, i.e., is the method valid for the present-day climate?
- How well does the CESM LIG simulation match proxy data regarding temperature and precipitation? The authors' results suggest that the large-scale circulation is an important driver of the storm surge changes. However, based on the results presented, it is unclear how well the GCM simulation reproduces the proxy-suggested large-scale climate change, and therefore, it is unclear how well the results in storm surge are.
- New analysis should be added on the mechanisms linking large-scale circulation and the storm surge changes. How does the large-scale atmospheric circulation impact regional storm surge? Does the mechanism depend on timescale? In other words, do we see similar mechanistic connection in present-day observations at short timescales (e.g., interannual and inter-decadal timescales)?