

Interactive comment on “Impact of climate change on the production and transport of sea salt aerosol on European seas” by J. Soares et al.

Anonymous Referee #2

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The manuscript presents an interesting study on SSA modelling in present and future scenarios, addressing the role of SSA in the climate system and the current difficulties in modelling it with sufficient accuracy. The manuscript is well written and the results are presented clearly. I recommend publication after the authors address the following (minor) comments:

L120. Correct “predicted an stronger” in “predicted a stronger”.

L158. For DEHM, there is a discrepancy in the upper cut of the predicted coarse SSA between the text and Tab. 1 (6 μm vs 10 μm), please clarify.

L366. The authors should explain why salinity was kept constant between present and future scenarios. Are salinity changes considered negligible within the considered time horizon? Is it technically impossible to model salinity changes for future scenarios?

C1

Too uncertain?

L413. Remove the comma after “but”.

L557. The calculated DRE must depend on assumptions made on the number size distribution of SSA, as radiative properties are driven by particle number and not by mass. This is not very clear in section 2.5, apart a brief note in lines 291-292. How does the SSA number size distribution deployed in libRadtran compares with the different mass distributions predicted by the models and how sensitive is the resulting DRE to changing the SSA number size distribution? The authors should clarify better these issues.

L565. This sentence would be more correct in this way: “Less cooling is predicted where the albedo is higher and SSA is amount is the lowest”, as no net warming is observed in Figure12 as an effect of SSA.

L570. Figure 12, not Figure 2.

L570. “The results suggest overall cooling (negative change) in the future”: I disagree with this interpretation of Figure 12. It seems clear to me that Europe is neatly divided in two, with cooling in the North and East and warming in the South-West (as it is addressed in the following lines).

L622. “According to this study the upward scattering by SSA, at TOA, can to be up to 0.5 W m⁻² over the seawater surfaces in the present period”: I would report also the average values over the sea here, as the maximum value is only representative of a very localized situation.

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