Manuscript “A nested Atlantic-Mediterranean Sea general circulation model for operation forecasting” investigates an effect of Atlantic Ocean boundary conditions on the circulation in the Mediterranean Sea. Two different boundary conditions for the regional Meditteranean model are considered. In the first, temperature and salinity are relaxed to Levitus climatology using nudging and sponge layers. In the second, Orlanski-type radiation boundary conditions are used to nest the Mediterranean model within the climatological global model. Careful analysis of the effects of boundary conditions on temperature, salinity and surface elevation is presented. Model results are then compared to the observations obtained from ARGO floats, satellite altimeter and tidal gauges. Results indicate that the second set of boundary condition is superior in terms of salinity and surface elevation, both in mean and seasonal variability.

Overall, the paper reads well, it constitutes a solid body of work, and it deserves being published with minor revisions.

In particular,

1. Page 1094: in addition to the description of the regional dynamics it would be good to a have a schematic of it. It makes it easier to follow the consequent analysis.
2. Chapter 2: Please indicate if there are any tides in the model. I presume not, but it would be good to confirm it, especially in view to the future comparison with tidal gauges.
3. Chapter 2: Description of the advection scheme in the new model is a bit confusing. Is it upstream at the passages and MUSCL elsewhere? What is the reason for switching from simple “centered 2nd order” scheme to the elaborate mixed scheme?
4. Page 1097 line 2 has a typo. Should be “centered” instead of “cantered”
5. Page 1097 line 15: please specify whether yearly or monthly Levitus climatology is used in MFS_V1. A reader is left wondering about that until you mention it in the Conclusion.
6. Please specify how many years of MERCATOR output are used to construct model monthly climatology that is used as boundary conditions in MFS_V2.
7. Chapter 3: Can you elaborate a little about why temperature is less sensitive to boundary conditions than salinity.
8. Figure 3 is a little confusing. There are results from two model simulations there, compared to the climatological curves. But which of the curves are obtained from which of the MFS models is unclear.
9. Page 1100 line 1: a typo. Instead of “that” should be “than”
10. Please mark months on Figure 6, it is difficult to follow your analysis of month-by-month changes without it.
11. Chapter 4.1: although MFS_V2 shows an improvement over MFS_V1 in temperature and salt at the surface, the skill of MFS_V2 deteriorates with depth, and is worth than MFS_V1 below 500-600 m. Could that be because of bias in climatological MERCATOR fields used in MFS_V2, as opposed to a bias-free boundary conditions in MFS_V1?
12. Page 1103, line 10: I do not buy an argument that the lack of significant improvement in pattern correlation is due to a fact that it is already good in MFS_V1. There are quite a bit of analysis of vertical structure of PCC curves that can be added.

PCC is a good indicator of how well mesoscale and small scale activity is simulated. For example, no improvement at the surface can indicate that all the patterns there are locally forced and do not depend on the boundary conditions. Improvement at 100-200 m – does it mean that MFS_V2 is better in dealing with thermocline? Again, deeper portion in MFS_V2 is worse, leading me to suspect that MERCATOR seasonal cycle is worse than that of Levitus. It is something which is worse investigating.

13. Chapter 4.2: please show locations of Envisat and Jason-1 altimeter tracks that are used in the analysis. Are you using all of the altimeter data, or you discard the data that is contaminated by the proximity to the land?
14. Please specify what do you do with the tidal signal in tidal gauge data? This also relates to the issue raised in 2.