

Ocean Sci. Discuss., referee comment RC1
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Comment on os-2021-123

Anonymous Referee #1

Referee comment on "Quasi-steady circulation regimes in the Baltic Sea" by Taavi Liblik et al., Ocean Sci. Discuss., <https://doi.org/10.5194/os-2021-123-RC1>, 2022

In this paper the data from several measurement methods (adcp- and current profiler mooring, on board CTD, glider missions and argo floats) are applied together with model simulations to further study the circulation patterns in the Baltic Proper. The topic is of interest and merits further research, as especially the currents on the deeper layers are not yet too well known.

The dataset and analysis provided here is a valid addition that increases our understanding of the conditions in the area and in my opinion well merits the publication with some minor additions. Data and methods of analysis are reasonable and the conclusions drawn from them valid. In general the text and presentation is clear. Few minor issues could use further work:

The combination of modelled results and measurements is an interesting part of the work. When considering the effects of bathymetry and model resolution, it would help to see the model grid size demonstrated with Figure 1 or (b or c perhaps) with grid overlay, or with 'measuring stick' to get a quick idea of the scale of details the model can catch.

In line 134 the authors mention a qc method for removing suspicious/failed profiles. How many were there? Giving a percentage of accepted profiles would clear up the reliability of the device.

In results, in the chapter starting from 289 authors compare the ADCP results with the ones given by the model, noting a southward bias in the model results. The agreement with the model and results is actually rather good, but I wonder could these biases be due to either resolution or bathymetry setup in the model. It might be worthwhile in discussion to ponder if tuning mode setup based on these findings could improve it further.

Around Line 341 the authors discuss the movement of the thermocline depth. How was the thermocline depth determined in this case? It would be clarifying to see a similar description than in the case of halocline earlier.

Few more comments which are more on the clarity of the manuscript, and perhaps a matter of taste:

-It might ease up the reading to state clearly when speaking of model data, when measurements, for example Fig 8-11, or in the chapter starting from 470. It is often clear from context, but for a quick reader it would help.

-Figure 1 text says "Study area (black box)" should probably be blue box.

-In Figure 7 (line 503) there are so many sub-plots that the area for each gets a bit small. I wonder, could it be possible to join for example ADCP + GETM + GEO-ADJ-GETM subplots together with different colors?

-Figure 11 (or other which is near to fig 12) could mark the location of transect of Figure 12 for comparison.