

Interactive comment on “On the representation of regional characteristics by hydrographic measurements at central stations in four deep basins of the Baltic Sea” by J. H. Reissmann

Anonymous Referee #1

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General comments:

In this manuscript the question is raised to which extent the central profiles of temperature, salinity, and oxygen within the sub-basins of the Baltic Sea are representative for the spatial averages. The manuscript is written in the form of a technical report and not as a scientific research paper. There are too many tables. The text is rather lengthy, includes various repetitions, and should be shortened considerably. Further, I do not really agree with the overall conclusion that “the regional characteristics of the investigated quantities and parameters are represented well by the hydrographic measurements at the central stations in the four regions in spite of some significant differences ...”. Figures 3 to 5 reveal that the central profiles in winter in the Arkona Basin, Bornholm Basin, and Slupsk Furrow are much sharper than the mean profiles (this is

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actually not astonishing) with deviations larger than one standard deviation. The halocline depths of the central profile and of the mean profile differ by 10 m approximately (Tab.8). Assuming a geostrophic flow model the transport is a quadratic function of the halocline depth (e.g. Stigebrandt, 1983; Kouts and Omstedt, 1993). Thus, a difference of 10 m in the shallow entrance area of the Baltic might be dynamically relevant. Especially in the Slupsk Furrow, but also in the Arkona Basin and Bornholm Basin, a considerable mesoscale activity has been observed (e.g. Piechura and Beszczynska-Möller, 2003, *Oceanologia* 45, 593-621). I suggest to use the data of the MESODYN project to investigate mesoscale dynamics in more detail. Indeed this is somewhat difficult as the horizontal spacing of the stations was only 4.6 km. Thus mesoscale eddies with typical baroclinic Rossby radii of about 5 km are poorly resolved. The investigation of mesoscale dynamics would be much more interesting than the present topic of the manuscript. I recommend a major revision before publication of the manuscript.

Special comments:

- 1) Introduction, page 365, line 15: replace “water cycle” with “freshwater surplus”
- 2) Omit Tables 1 to 5 and include their information briefly into the text. Figure 2 might be merged with Figure 1.
- 3) Condense Tables 8 to 10. Give only the numbers of a few selected parameters.
- 4) Details in Figures 3 to 6 are difficult to see. The size of these figures should be increased and other colors for the summer profiles should be used.
- 5) The title of Section 3 should be “Method”. This section should be shortened considerably. Do not repeat the calculation of the baroclinic Rossby radii but refer to the literature.
- 6) Also the Sections 4 and 5 need to be shortened.
- 7) Add another section investigating the spatial scales of the data sets as mentioned above.

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