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Interactive comment on “Distribution of intermediate water masses in the subtropical northeast Atlantic” by I. Bashmachnikov et al.

Anonymous Referee #1

Received and published: 22 June 2015

General Comments:

The manuscript “Distribution of intermediate water masses in the subtropical northeast Atlantic” by Bashmachnikov, Nascimento, Neves, and Menezes describes exactly what its title claims. The paper provides a detailed description of water masses in the NE Atlantic, matching distribution maps from an OMP with velocities derived from lagrangian floats. Fundamentally the work seems sound and will be relevant to researchers interested in the water masses of the NE Atlantic.

My most significant comment is a structural one. The introduction & conclusion of the paper lack strong motivating statements that clearly put the work in a broader context. The reader is asked to immediately confront the very detailed and complex description of water masses in the literature review starting in section 1.1. I felt like I didn’t yet have

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sufficient motivation to know why it was important to struggle through all the complexity of the water mass structure of the region. Perhaps this is a specific issue I have not being thoroughly immersed in the NE Atlantic research community, but I feel strongly that the paper could be greatly improved by motivating the work more clearly, and perhaps reducing the detail given in sections 1.1-1.3.

Otherwise the scientific methods and assumptions are reasonable, and mostly clearly outlined. The data used is presented clearly and well referenced. The results seem to largely confirm the overview given in the introduction, but have value by using independent climatological data sets.

Specific Comments:

1) I found it difficult to create a picture in my head of the overview of water masses described in sections 1.1-1.3. There are no references to figures in this section. I felt that some schematics or TS figures to be referenced by the descriptions in the text would help. Also maybe a map of the region with labels for important reference locations like the MAR, Azores, Canaries, etc. It is difficult to envision the spatial and TS distributions in your mind even if they are precisely described in the text. Particularly because of the huge number of numbers (temps, salinities, lats, longs) I found myself lost very quickly in the introduction. I would suggest that the authors try to simplify and use figure references rather than so much written quantitative description. The tables can hold much of the quantitative water mass definitions that the reader needs to know for the OMP.

2) The description of how eddy motions are removed from the float velocities is unclear. page 777, line 28 refers to 'blanking' the parts of trajectories that meet the eddy criteria. then page 778 line 14 talks about 'filtered' trajectories. I'm not clear on whether the velocity records are filtered or the eddy parts are just removed. What type of filtering is used?

3) Figures 9 & 10 really helped clarify all the written description. I realize these are

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results, not introduction, but this is the kind of visual explanation that is lacking in the introduction.

Technical corrections:

[I will use the page # and the line # to indicate the location of a correction. For example section 770, line 12 will be 770.12. I will write WC when the Word Choice in my opinion could be better, i.e. the chosen word is inappropriate or confusing.]

-The abstract contains some references to things/acronyms that are not defined, making interpretation of parts of the abstract difficult. In particular: the “first transition line” line A.11. What is the first transition line? Secondly: the MUC is used but not defined until somewhere late in the paper (line A.19). The abstract should be self contained and accessible without reference to the text.

-line 770.14: “verified”, WC. Should be ‘met’ or something like that. -line 770.18 “re-sults” should be singular -line 770.25 Water Masses and Source Water Types have distinct definitions in the Tomczak et al papers. The former is a result of linear mixing of the latter.

-line 775.3- first definition of Mediterranean Undercurrent, although used before -line 776.4 “fractions” -WC- should be ‘types’ - 776.7-10: NADW flows about half and half east (3Sv IFR& Faroe Bank Channel) and west (3Sv Denmark Strait) of Iceland over the Greenland-Scotland Ridge. See Hansen & Osterhus 2000. Not maily through the Denmark Strait - 776.9: “Island” should be Iceland

-778.26 I assume “SD” is standard deviation, but it should be defined before the abbreviation is used.

-781.3 : “urges for”, not quite right word choice

-788.7-8 WC: “There can be also detected. . .” and “Luck of”, needs re-wording

-Figure 13. The description of the offshore plotting of planetary Beta is confusing.

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Meridional variations are still hard to see, but is is 10^{-9} smaller than topographic Beta? Is it relevant then? Also the arrow pointing to C. St. Vincent in the right hand panel is pointing somewhere off.

-Figures 9-11. mAAIW is labeled on the figures as AA. Needs to be consistent with mAAIW in text.

Figure 12. Nice figure, but its hard to see black arrows on brown and the yellow arrows on tan.

Interactive comment on Ocean Sci. Discuss., 12, 769, 2015.

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12, C314–C317, 2015

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