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Ocean Science Discussions

Interactive comment on "Observed and simulated estimates of the meridional overturning circulation at 26.5° N in the Atlantic" *by* J. Baehr et al.

Anonymous Referee #2

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This manuscript presents interesting results on comparisons of one years worth of data from the RAPID/MOCHA array to the output from two types of numerical models. The analyses are worthwhile, and I recommend that the paper be published subject to minor revisions.

COMMENTS:

1. In the 4th point in the conclusion section the authors note that there is little temporal correlation between the ECHAM5/MPI-OM solution and the observed MOC. As the authors noted in a previous section, this is completely expected, since the ECHAM5 solution is a free running coupled model, and there should be no correlation between the time sequence of events on that simulation and observations. I strongly suggest that this bullet conclusion be deleted (or at least modify it to remove the ECHAM5

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statement), as should the corresponding sections of the main text that present and discuss this point. Given this issue,please clarify why there is utility in using the ECHAM5 results in the Taylor diagram in Figure 8. Perhaps I have missed the point.

2. On p. 1350, lines 10-13, it is stated that "... the correspondence between the level of variability in MOCHA/RAPID and ECHAM5/MPI-OM increases the confidence in the estimates of detection times for MOC changes gained from such a model". I am confused by this statement. The time scales for MOC changes induced by radiative forcing changes (which I assume is what is referred to for detection times) are of the order of decades. In order to have better confidence in the ability of models to detect such changes, we would need to have confidence in the models simulation of variability on decadal time scales, not on intraseasonal time scales as analyzed here. I suggest that this statement be deleted - I do not think the analysis presented here supports that in any way. If I am wrong in this assessment please add text to clarify.

3. For Figure 2 it would be useful to add panels showing the differences in the profiles, since these differences are discussed in the text but have to be inferred by visually comparing these profiles.

4. Since there is extensive discussion of the differences between the two models and the observations in terms of the profiles of temperature and salinity, it would be useful to comment on hypotheses (if they exist) on the reasons for the model biases.

5. The hydrographic characteristics at 26.5N are better simulated in ECCO than in ECHAM5, and yet the time-mean of the simulated MOC is better in ECHAM5 than in ECCO (bullet point 2 in the conclusions). I did not see a discussion of this, but it would be useful.

Figures

Figure 4 ... why is just one realization used for ECHAM5?

Figures 5 Need labels on figures for which is a,b,c,d as used in caption.

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Typos

p. 1340, line 7 "were" should be "where"

p. 1341, line 16 "availably" should be "available"

p. 1346, lines 14-15 Confusing grammar; please clarify

p. 1347, line 15 Should "and" be "are"?

Interactive comment on Ocean Sci. Discuss., 6, 1333, 2009.

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