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Discussions

Interactive comment on "The contribution of eastern-boundary density variations to the Atlantic meridional overturning circulation at 26.5 N" *by* M. P. Chidichimo et al.

Anonymous Referee #2

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Review: The contribution of eastern-boundary density variations to the Atlantic meridional overturning circulation at 26.5N

Authors: M. P. Chidichimo, T. Kanzow, S. A. Cunningham, and J. Marotzke

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Overview: This is a clearly written, well organized paper describing the impact of variability near the eastern boundary at 26.5N on the basin-wide integrated MOC. The authors isolate the variations of the eastern boundary and evaluate both the representativeness of the two eastern 'moorings' for use as the eastern boundary of the MOC calculation and the spectral character of the eastern boundary variability (primarily sea-

sonal). While the authors use first-person stylings in the paper, which I generally do not like, in general this is one of the better written papers I have reviewed in recent years. My recommendation is for the paper to be accepted, although I do have a number of minor suggestions and/or comments below that I would encourage the authors to address. I do not need to see the paper again prior to publication.

Specific comments:

1. This is really more of a comment relating to the journal submission system than to the authors, however as a reviewer it is very inconvenient not to have the figure number printed right on the figure. Requiring the reviewer to print out all of the individual figures and the text file rather than providing a single document file is less than optimal.

2. Page 5, Data section paragraph 1: Not all of the moorings in the RAPID/MOCHA array are serviced every 12 months - some are serviced on 18 month turnarounds. This is a minor detail, however given the fact that the results of this paper are dependant on all of the components of the array and not just the UK moorings it is perhaps preferable for the different components to all be described accurately (with proper acknowledgement as well).

3. Page 7ff: There is not a particularly detailed discussion of the errors associated with mooring motion in this paper. Given the fact that a reader may attribute some of the differences between EB1 and EBH as relating to differing amounts of mooring motion at the two moorings, it may be to the advantage of the authors to clarify this issue.

4. Page 8, equation 1: Is it necessary to indicate that 'z' denotes 'negative depth'? As the equation itself is not shown, I think it would be sufficient to indicate that 'z' denotes 'depth'.

5. Page 8, last paragraph: Given the fact that the Gulf Stream data used in this calculation is based on the cable, and hence is a vertically-integrated quantity with no vertical structure information, it is probably a good idea to clarify here with a few more words

how you are obtaining T_GS(z,t).

6. Page 19, line 5: Do you have a citation to back up the claim that the eastern boundary bottom velocities are small? I'd suggest you add one so the reader doesn't have to take this claim on faith.

7. Page 19, paragraph 3: Might be useful to include the annual cycle amplitudes of all of the contributing components to the total here. Does the seasonal cycle in the total agree with those of all of the components in a square-root of the sum of squares sense?

8. Conclusions: A few words about the other (longer) time scales in the data may be useful here even though it is at the limit of what is possible given the 3.5 year record. I do not think the authors want the reader walking away from this paper thinking that the eastern boundary contributes only a seasonal cycle, as that might suggest that the eastern boundary moorings are unnecessary as a 'mean seasonal cycle' could be modeled from the first few years and added to the longer time-scale variability of the western boundary.

Interactive comment on Ocean Sci. Discuss., 6, 2507, 2009.