

## ***Interactive comment on “Fast thermistor string observations at the slope of Great Meteor Seamount” by H. van Haren et al.***

### **Anonymous Referee #1**

Received and published: 19 January 2005

The paper describes observations of internal waves and mixing made in a depth of about 500 m on the slope of a seamount using a novel very fast response time ( $< 0.25$  s) string of closely spaced (0.5 m) thermistors. It describes field calibrations and compares the observations from the thermistors with those from an in situ ADCP.

Before commenting on this paper I should point out that Ocean Science Discussions is a new journal concept to me, and I am not entirely certain what standard I should be applying to the refereeing process. However, since the editors are well established scientists, as is the lead author, I will assume that I should apply the same standard as I would for a more conventional paper.

All in all I think that the idea of using a fine resolution thermistor string for in situ process studies has potential merit, so it is with regret that I have to say that I do not find that the paper matches merit of the idea. To put it succinctly, it is not clear to me

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whether the authors intend it to be a technical description of the instrument package, or a discussion of some scientific observations, because it trying to do both they have fallen between two stools and achieved neither objective. This problem becomes immediately apparent in the abstract, which briefly describes the instrument but fails to provide any new science from the observations. For example, they could easily have done some Thorpe scale calculations, and got out some estimates of mixing that might have given us some insight into mixing in internal waves. Furthermore, and very telling from my point of view, they have not told us where this work might be leading. What we are left with is really just a lot of gee-whiz stuff that ultimately leads to very little. However, whilst I don't think that the paper merits justification in a peer reviewed scientific journal, I think it could be submitted to a trade publication such as Sea Technology. Nevertheless, before being submitted there, I think that quite a lot of work still needs to be done as I outline below:

1. P38 L20. Who requested more information? What's the point of this statement?
2. P38 para 2. This paragraph is rather confusing, and not helped by the fact that the authors liberally mix space and time scales. e.g. 'towed' instruments can't 'prove' the temporal scale of temperature variations.
3. P39 L17. To say 'N' is one the 'most difficult' parameters to measure is too strong. We get by pretty well at normal space and time scales - everything becomes difficult at the extremes.
4. P40 A detailed figure of the instrument package is needed.
5. P41 para 3. There is too much information about calibration at this point in the paper - the text should be reduced here.
6. P42 para 1. What is the bin size? A sketch of the mooring arrangement would be helpful
7. P42 L25 and elsewhere. There's a horrible mix of depth units (m, bars and mab) which is confusing. This should be sorted out.
8. P44 L9. Ref needed for double diffusive processes.
9. P44 L21. Claim that current friction caused the change in depth needs to be moderated, or evidence produced.
10. P44 L5. '()' needed in equation?
11. P45. I've read this explanation about in situ calibration several times, and I can't get my head round what's happening. This ties in with Figs 3 and 4. When the CTD package is held still the thermistors appear to be very noisy. The authors mention this in the figure

caption but, so far as I can see, make no reference to it in the text. This noise is very important, and I don't understand what the authors have done about it, and if it was filtered out then how was the time constant affected. Also the divergence between the two profiles in Fig 3a is worrying, but again not discussed. Finally, in Fig 4 why are they trying to calibrate using the moving CTD package? 12. P46 L20. The reference to Hokusai-san is not helpful. A copy of the picture is required at least, but a more relevant analogy would be better. 13. P47. L2-4. More information is needed here. 14. P47 L13. 'modified' - does that mean 'times' or 'divided by'? 15. P48, L4. Statement about confidence in  $w$  is not explained properly and assumes that the reader knows more about ADCPs than is reasonable. 16. P48 L22. Sentence starting 'The turbulence ...' is weak. 17. Table 1. A column describing the CTD is required. 18. Figs 3 and many others. The x-axis is given in terms of year-day. But the authors are extolling the virtues of a fast response sensor package, and in my opinion it is disappointing that they haven't gone to the trouble of converting this axis to seconds, or minutes. 19. Fig 5. Red and blues lines in a) are not explained. The white rectangle in b) doesn't look like the stuff reproduced in c). 20. Fig. 6. Far too small to be meaningful 21. Fig. 7 likewise

In addition, the use of English in the paper is poor, there are too many unsubstantiated claims, assumptions and expectations made of the reader. I am very surprised at this given the productivity of van Haren, and I have to admit to an annoying suspicion that I've been asked to review someone's MSc thesis (and a not particularly good one at that). As I don't think that this paper should be published here I have not gone through it in any great detail to pin point all the problems, but I suggest that should the authors decide to publish elsewhere then they would be well advised to get some help with their use of English.

Finally I would like to offer a comment to the editors of OSD. On the title page they state that the paper has been accepted and published. This is very misleading because it implies to the uninitiated that it has already undergone the peer review process, which

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quite clearly has not happened. I recommend that they change these statements, because once converted to hard copy there is no way of any third party knowing the true status of the manuscript. If this is not done then I fear that the journal will fall into disrepute.

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Interactive comment on Ocean Science Discussions, 1, 37, 2004.

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