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Ocean Science
Discussions

Interactive comment on "Combining in-situ measurements and altimetry to estimate volume, heat and salt transport variability through the Faroe Shetland Channel" *by* B. Berx et al.

Anonymous Referee #1

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This paper sets out to summarise results from 8 years of velocity data in the Faroe-Shetland Channel, in order to calculate the net transport of Atlantic Water into the Nordic Seas through the channel. The paper is well written, has good, clear figures, and fills a sizeable gap in the literature. The results include a new mean volume transport estimate, with associated heat and salt transport, and an absence of a discernible multi-year trend in them.

My one major comment is that there is considerable repetition in Section 6, which is called discussion, but largely consists of summaries of results presented earlier, with a few paragraphs of true discussion. Some points are repeated a third time in

Conclusions. I recommend that the paper be shortened by redrafting section 6 to remove the repetition. I give specific examples below.

Abtract: the first line contains the acronym ADCP which needs to be expanded. Otherwise, the abstract is very well written and a nice summary of the paper.

p160 line 18, this may be a wording issue, which has led me to misunderstand - here you mention the average $\pm$ stdev of the 5°C isotherm being at least 320m, but in Table 2 you show the range of the depth of the isotherm, which isnt quite the same thing. Could you clarify?

p161 first paragraph, and later through the text. You test the significant of a seasonal cycle here, and elsewhere, and provide some discussion about whether it is believable or not, but you avoid discussing whether the fitted curve is what you might expect. There has been some literature about seasonal cycles in velocity and transport in nearby regions, so some discussion about what the expected cycle might be, and whether it is what you observe, would be useful.

p161 second para. Some clarification is needed here - you say there is a statistically significant trend (decrease in inflow) but then qualify it in a way I dont quite understand (do you mean that it is probably not significant after all?). I was surprised by the noting of a significant trend because it is counter to what I had just read in the abstract.

p161 line 16, I think this is actually shown in Fig 5 isnt it?

p161 and Table 4. Are the statistics in the last column of Table 4 from altimeter-adjusted AW velocities? If so, it would be better to label them as such.

p162 line 12, this reference to Table 4 is probably not necessary since you refer to it just above.

p162 last para, and elsewhere. Your argument for using the core interpolation in the eastern part of the section is perfectly reasonable and makes sense. Yet you chose not to do the same for the other, albeit less strong, current core in the west. It looks

to me as though the linear interpolation underestimates the southwestward flow too, which might impact on all your subsequent calculations.

p163. On this page you present the transport as inflow =3.5Sv and outflow = -3.1Sv, and from this inflow you calculate the heat and salt transports. But later (p168) you say that the mean Atlantic inflow is 2.7 Sv. It would be worth more fully describing Table 5 in the text and how the 2.7 Sv relates to the property fluxes here on p163 to avoid confusion later.

p163. There have been previous estimates of heat and salt transport in the Rockall Trough and Iceland Basin - how do your results compare with those? I'm thinking in particular that the Rockall Trough results should compare with your NEward transports... and if you look in Holliday et al 2000 you will find that they are 130TW and 123 x10**6kg/s in the mean for an earlier period, which is surprisingly, and encouragingly similar.

Discussion. As I said above, there is quite a bit of summary/repeated information here - there is nothing wrong with a summary of results of course, but I think some trimming here would be beneficial to the paper, giving more room for real discussion about comparison with previous results, or implications for volume/heat/salt budgets of the subpolar and Nordic Seas. In section 6.1, the only piece of information new to the document is around line 4 on p169. Paras 1 and 4 of section 6.2 are simply summary of results, as are sections 6.4 and 6.5.

Interactive comment on Ocean Sci. Discuss., 10, 153, 2013.