Ocean Sci. Discuss.,
https://doi.org/10.5194/os-2017-88-SC1, 2017

Ocean Science Discussions

Interactive comment on "Shelf sea tidal currents and mixing fronts determined from ocean glider observations" *by* Peter M. F. Sheehan et al.

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Received and published: 22 December 2017

This paper is assessing the methods and application of using a glider data from a single transect occupation, spanning several months, to determine tidal velocities, frontal position and the controls on this position. The paper was divided into 2 parts; assessment of the method and then use of the data. The method appears more leading edge than the application of the data to the problem.

This is a novel use of glider data to determine tidal velocities and the location of a front for analysis of drivers; this is an application worth highlighting for the reasons given and demonstrates that gliders are able to cost effectively provide data on ocean variability at sub seasonal scales. This is important to advancing our understanding of the interplay,

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Discussion paper

at different scales, of drivers of ocean variability and improving model representation. Overall I think this work has value in highlighting this method and application for gliders. I have provided a couple of comments and a couple of minor edit notes.

1. The glider accuracy of the glider estimated DAV is dependent on the gliders internal compass and flight model used for the calculation, many authors including those cited in the paper recommend a procedure for correcting or calibrating the glider compass (Merckelbach, Smeed & Griffiths, 2010, Todd et al. 2011). For example 'swinging' the glider in a cradle/table, which produces a compass correction curve, similar to those traditionally produced for ship compasses (e.g. used with Spray/Slocum), or in situ spiral calibration flight (e.g. used with Seaglider). The article mentions visually inspecting the data, however it is worth expanding on this point. Although the comparison of the results is compelling and suggests the data is not overly affected by compass error, it is presumably one of the sources of error.

2. A significant part of the paper is about the novel method and potential benefits to other areas. Could it be worth summarising recommendations for future projects?

3. I am not a tidal expert, however the model used seemed potentially old and and so the utility/reason for selecting this model could be better explained. If it is to only to indicate when heating is dominant, is the variability that we see between glider and model in the earlier part of the study a result of mixed dominance/drivers in this period?

Minor edit notes: Section comparison with model output: 4th paragraph, line 6. 'tidal stirring becomes ever more dominant' – change every to ever Section comparison with model output: 4th paragraph, line 8. (main front $\pm$1.59 km day-1 $\pm$0.08 km day-1; excludes the secondary front. . ..) – some suggested re-wording, as it took a couple of minutes to work out what this meant.

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