Ocean Sci. Discuss.,
https://doi.org/10.5194/os-2019-15-RC2, 2019

Ocean Science Discussions

Interactive comment on "Internal tide energy flux over a ridge measured by a co-located ocean glider and moored ADCP" *by* Rob Hall et al.

Anonymous Referee #2

Received and published: 8 May 2019

Internal tide energy flux over a ridge measured by a co-located ocean glider and moored ADCP

Hall et al

Overview

This manuscript describes a 3-day measurement of density by a glider and currents from a moored ADCP. With this combination, energy flux and density are calculated. Errors are carefully considered by simulating glider motion in an idealized internal tide wave field. For typical glider performance and internal tides, modes 1-2 and perhaps can be calculated with less than 5% error. That seems pretty good. I recommend publication with some minor points noted below.

Printer-friendly version

Discussion paper

The only thing that I would recommend is using the existing model to assess some spatial decorrelation scale for internal tide amplitudes and energy at the mooring site. The authors describe that there may be considerable variability in space and they have a tool to calculate it. As is though, the manuscript is fine. Whether or not to do this, I leave to the authors.

Some minor points:

1/16th wavelength diameter watch circle should be emphasized in figures and text because that appears to be relevant to these observations. 80 km tidal wavelength. 5 km watch circle.

Emphasize earlier on about the inability to separate S2 and M2. Maybe you want to call it D2. The discussion of spring-neap in the summary is good. Maybe this could go in the intro. 40 h analysis window limits this further than the 3 day observation period implies.

P4 L10. As you note the profile ends count as 1 observation. Only at the mid point are you doing better by a factor of 2

P4. Please explain up- and down sampling. Linear interpolation?

P7. Bottom friction plays an unclear role (for me at least) in the separation of barotropic and baroclinic. Friction applies to the total velocity and lowers the depth mean.

Calculate rms difference for various depth mean flows.

Which mode has a phase shift near 550 m? Fig 3.

Fig 4b should be solid lines according to caption- not interpolated.

Fig 4c should have only a portion dashed- should be mostly solid

Table 1. For angles you could use bearings.

Section 4.1 has pretty good model-data comparison. Are you doing same or better

Printer-friendly version

Discussion paper

than other models that you have referenced? Also on p 17.

Fig 5a green flux vector is hard to see.

Fig 5. How about energy density from model compared to your observations? How was the magenta representative box decided?

P12 L25. Also gets you faster dives.

Fig 8. Use colour to highlight most relevant choice for these observations

Table 2 will be handy

P18 L28. Explain the choice behind modal amplitude decay.

Interactive comment on Ocean Sci. Discuss., https://doi.org/10.5194/os-2019-15, 2019.