Responses to reviewers

> Reviewer comments are formatted like this.

Our responses are formatted like this.

Reviewer #1

> This is a very nice paper with only a few minor modifications requires for publication (in my opinion).

Thank you for the positive feedback and support!

> Line 186: It would be helpful if you could add a little more detail about how you normalized your spectra and cross spectra to preserve variance.

Not sure how to respond here; the equations are there.

> Line 197: I believe that you should say "add" instead of "subtract" when discussing the motion compensation approach that you utilized.

We've replaced the word 'subtract' with the word 'remove', so the sentence now reads, "The essential approach of motion correction is to measure velocity on a moving platform and make an independent measurement of the platform motion, then remove the motion from the velocity measurements."

> Your paper would read better if you reference all of your figures from within the text. I believe that at very least Figures 2-6 and 15 are not referenced from the text.

We apologize for the confusion on figure numbering. All figure numbers have been corrected.

> Figure 6: Is your presented measured acceleration based velocity spectra for the horizontal directions or the vertical direction? The magnitudes of these should be different and therefore I would suggest presenting both of these in this figure. Also, is your ADV Doppler noise calculated for a flow parallel or perpendicular to the head? Since these are different I would suggest presenting both of them in this figure. Also, a couple sentences in the text about how this was calculated would be helpful.

Thanks for catching this. We have added the vertical component noise spectra, and the vertical component ADV noise levels. **NEED TO SAY MORE HERE - about how we calculated things, and that we added the 'rigid-pole' model of the TTM**

> Line 316: Your figure number should be corrected as you do not have a figure listed as (Figure A1). Should this be Figure 6?

We apologize for the confusion on figure numbering. All figure numbers have been corrected.

> Please mention if the IMU data discussed in the appendix was high pass filtered.

Thanks for catching this. We have added text that clarifies that a 5 minute high-pass filter was used in this case and we have also indicated this filter frequency in the figure.

Reviewer #2

> Overall, I recommend Minor Revisions before publication. The manuscript is a succinct summary of a novel application of an IMU equipped ADV for making turbulence measurements including estimating Reynold's stresses and dissipation from moving, moored platforms that is of potential interest to both marine energy developers but also more broadly to researchers studying turbulence in natural settings. Moored platforms are ubiquitous and inexpensive and the use of motion correction for ADVs on such platforms represents a low-cost and apparently effective solution for making such measurements. Thus the article is a good fit for JAOT.

Thank you for the positive feedback and support!

> I only found minor issues with the article that should be addressed before acceptance: Line 142: the weight of the anchor is given in pounds rather than Kilograms as the in the case of the TTM platform. Units should be consistent.

Thank you, we have corrected the units.

> Line 215 and 216: refer to Figure A1. There is no figure A1. I assume the authors meant to refer to Figure 6. This should be corrected.

We apologize for the confusion on figure numbering. All figure numbers have been corrected.

> Line 340: "torpedo is broadbanded" is awkward, perhaps the authors meant the "torpedo is broadband"?

Thank you, we've made the suggested correction.

Reviewer #3

> This manuscript compares turbulence measurements from 3 different moored platforms and describes a methodology for using ADVs, synchronized with inertial-motion-sensors (IMU), to collect reliable measurements of turbulence. It is part of a 2-part series describing the use of ADVs with IMU sensors in measuring turbulence. The paper fits well within the scope of the Journal of Atmospheric and Oceanic Technology and presents a valuable analysis of new technology that could be of great use to future observational studies of turbulent mixing. I would recommend the paper for publication once the following items have been addressed.

Thank you for the positive feedback and support!

> ### Major Comments:
>
> (Figure 6): Is Figure 6 incorrectly listed as Figure A1 in the manuscript? It appears to be demonstrating the effects of high-pass filtering on the signal-noise ratio of the IMU data, but since there is no mention of Figure 6 in the manuscript it is difficult to ascertain where it fits and what it is contributing to the paper.

We apologize for the confusion on figure numbering. All figure numbers have been corrected and all figures are referenced within the text.

> (page 12, line 236-237): Can you give more detail for the basis of setting the cutoff frequencies to 0.033Hz and 0.2Hz for the two deployment configurations? This seems to be an important caveat of the motion-correction methodology that is platform-specific, so including more detail would be useful for future studies employing similar techniques. What is the sensitivity of turbulence estimates to the selection of cutoff frequencies? Did you try calculating results using different cutoff frequencies - how did they compare?

This is nearly complete in the revision of the methods section. NEED TO WRITE RESPONSE.

> (Figure 11): There is significant spread in these cospectral plots that makes characterizing the quality of stress measurements difficult. It would be more informative to present variance-preserving cospectra. A comparison of observed curves to a generalized semi-empirical model for turbulent cospectra (e.g. Kaimal et al 1972) could provide further information regarding the accuracy of moored cospectral flux estimates that have been motion-corrected.

I'm not really sure what he's asking for here. I am already plotting variance preserving spectra. Kaimal 1972 plots cospectra on a log-scale and multiplies by *f*. I hesitate to use a log-scale because we have negative and postive values. I'm thinking I should use Ogive curves instead of cospectral plots. This could complicate the picture though. Thoughts?

> (page 20, line 416-421): The authors discuss a production-dissipation balance in the TKE budget that is indicative of a bottom boundary layer, but the complex topography of the site and depth of the measurements warrants more discussion regarding other processes that could play a significant role in the observed TKE budget. What are typical stratification conditions at the site?

This should be pretty straight-forward. I just haven't gotten to it yet.

> (Figure 14): There appear to be significant asymmetries between turbulent dissipation measured during flood and ebb shown in Figure 14 - can you separate the balance shown in Figure 13 and comment on flood/ebb asymmetries? How does it relate to times when production does not equal dissipation?

Still need to look at this. Not quite sure how to respond.

> ### Minor Comments:
>
> (page 2, line 17): "However - because of" - should this be a comma?

We've changed this to a comma.

> (page 2, line 19): "easy to deploy -- ADVs" - should this be a comma?

We've changed this to a comma.

> (page 3, line 39-41): Can you break this long list of references into subsections that correspond to the different deployment methods listed earlier in the sentence?

Thanks, we've made this change.

> (page 4, line 60): Vector data stream (,) so that its motion…

Thanks, we've inserted this comma.

> (page 4, line 71): "In wind,"…should this instead say "In the atmosphere,"

We've made this change.

> (page 11, line 216): "Figure A1" - see major comments.

We apologize for the confusion on figure numbering. All figure numbers have been corrected.

(page 17, line 351-352): "…quantifying this essential turbulence…" - delete "essential" as that depends on the application.

We've made this change.

(page 8, line 164): There is no reference to Figure 5 in the manuscript, add a statement referring to Figure 5 when describing the turbulence platform.

We apologize for the confusion on figure numbering. All figure numbers have been corrected.

(section 2a): The numbering of deployment subsections within a numbered major section (Measurements) is confusing. Is it necessary to make these two deployments separate sections, or can you just explain it within the text?

Thanks for this. These headings are redundant. We've removed them.

(page 11, line 219-221): Did you measure this low-frequency translational motion during the experiment? You say that it is important, but it is not clear how you addressed it based on this statement. This paragraph in general is a little difficult to follow, consider refining it before publication.

This is nearly complete in the revision of the methods section. NEED TO WRITE RESPONSE.

(Figure 15): Should Figure 15 be listed as Figure A1? There is also no mention of this figure in the manuscript.

We apologize for the confusion on figure numbering. All figure numbers have been corrected.