

Ocean Sci. Discuss., referee comment RC2
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Comment on os-2021-71

Anonymous Referee #2

Referee comment on "Impact of acoustic Doppler current profiler (ADCP) motion on structure function estimates of turbulent kinetic energy dissipation rate" by Brian D. Scannell et al., Ocean Sci. Discuss., <https://doi.org/10.5194/os-2021-71-RC2>, 2021

This is an interesting and very clearly written paper. It reaches well supported conclusions of value to the many ADCP observations of the ocean. The conclusions are logical and produce a concrete list of recommendations based on their evidence. I enjoyed the combination of observational evidence and synthetic data, which produce a useful combined message. I also found the geometric problem of how to produce the synthetic data interesting in itself and Appendix C lays this out in a good level of detail for reproduction. There are a few minor details that the authors should consider. However, the paper is otherwise ready for publication as is.

Minor Comments

line 118-121 : Some context for the numbers quoted here would be very helpful to those less familiar with ADCP measurements than the authors. Are the 20° beam angle, bin size and number of bins typical? Is the shear value large or moderate? How do the values of epsilon compare to the expected values?

line 122-124 : Can an error estimate be provided a priori? Or is the error unconstrained at this point in the paper?

line 145 : When I got to this point I realised that I wasn't quite as sure on the geometry of the problem as I thought. There are quite a few angles involved, due to the inclination of the ADCP beams, the heading angle, etc. I think it would be a good idea to lay this geometry out clearly in some form of schematic. It would help to visualise the rotations of the ADCP if I could refer back to such a figure later in the paper.

line 263 & Figures 3 & 5 : There's lots of information in these figures and they are very well drawn. It would be helpful to have something in the figures to show the point in the oscillation cycle that the ADCP is at in panels b-d. This would tie them to the markers in panel a. I think this would help with understanding some interesting details of the figures, such as why the oscillation frequency might differ between beams. Perhaps reduce the number of cycles shown in panels b-d and include the circle/square/diamond/triangle systems for the first oscillation?

line 284-286 & 340-346 : The ranges used in the different scenarios are very clearly laid out. However, there isn't any information on why they were chosen. Are these values pulled from the observations? Or from reasonable values based on experience?

Typos

I noticed an extraordinarily low number of typos.

line 53 : us -> is

line 382: , is -> is