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Comment on os-2021-107

Achim Randelhoff (Referee)

Referee comment on "Technical note: Turbulence measurements from a light autonomous underwater vehicle" by Eivind H. Kolås et al., Ocean Sci. Discuss.,
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Review of "Technical note: Turbulence measurements from a Light Autonomous Underwater Vehicle" by Kolås et al.

This paper reports on experiences with integrating microstructure shear sensors on a lightweight autonomous underwater vehicle (AUV). A particular challenge to overcome is that small AUV fly less stably, being actively propelled and manoeuvring, contaminating microstructure spectra. The authors report good data quality down to about $5e-8$ W/kg dissipation, which makes it fit only for measurements in turbulent boundary layers, which I do not see as too big a constraint given the lightweight nature of the AUV in the first place. This technical note is very thorough and I only have a few comments and further questions that the authors may wish to consider during revision.

75: DVL was downward looking? DVL1000 I assume means a 1 MHz instrument? With 1MHz the DVL probably did not have bottom lock (Though I have not checked the bottom depth at your location) - how is the trajectory (see Fig 1b) so well-constrained? What is the navigation accuracy? Were there other navigation aids apart from inertial?

147: Why is this used as opposed to the methodologies used by Moum et al. 1995 or Fer 2006 (iterative integration)?

184 and 230, regarding data quality differences between dw/dx and dv/dx : You could consider adding a remark on how stratification and/or violations of isotropy may play a role or not, given that it seems to be worse at lower dissipation (lower buoyancy Reynolds number - but how low?).