

Interactive comment on “Wave-turbulence scaling in the ocean mixed layer” by G. Sutherland et al.

Anonymous Referee #2

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The paper would need some efforts. I am quite sure the data and exposition of the results are of interest for the community. Yet, the abstract and conclusions are quite misleading. As it is mentioned turbulent kinetic energy dissipation rate is analyzed to be quite consistent with a wind shear-driven wall layer, but also that many profiles rather scale with a Stokes-driven shear. After reading the analysis, it is clear that the experiment spanned a period of veering wind and waves, and it is certainly a bit delicate to conclude without properly trying to separate the residual sea from the local wind-driven sea. I would suggest to try to possibly use numerical directional wave spectra, constrained by the 1D-spectral measurements.

The authors further seem to avoid to analyze the fact that the mixed layer is rapidly evolving. It would be very interesting to study and test in more details the consistency between the time evolution and levels of wind, waves, and measured TKE with the observed mixed-layer erosion and deepening. Accordingly, and given the apparent

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high quality data sets, this more thorough analysis would possibly help to more quantitatively assess the role of variable atmospheric forcing, waves and related Langmuir circulation, compared to standard parameterization, in such a rapid and well observed deepening process.

Finally, the authors state that integrating the TKE over the mixed layer yields results that 1% of the wind power referenced to 10m is being locally dissipated. Again, given the rapid time evolution of wind, TKE, and mixed-layer depth, idealized models can be used and questions be addressed concerning the overall transfer of momentum (and possibly heat) to erode the base of the mixed-layer.

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