

# ***Interactive comment on “Turbulence and hypoxia contribute to dense zooplankton scattering layers in Patagonian Fjord System” by Iván Pérez-Santos et al.***

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Interactive comment on “Turbulence and hypoxia contribute to dense zooplankton scattering layers in Patagonian Fjord System” by Iván Pérez-Santos et al. Anonymous Referee #4 Received and published: 28 December 2017 Review on “Turbulence and hypoxia contribute to dense zooplankton scattering layers in Patagonian Fjord System” (os-2017-89) by I. Perez-Santos, L. Castro, N. Mayorga, L. Ross, L. Cubillos, M. Gutierrez, E. Niklitschek, E. Escalona, N. Alegria and G. Daneri The authors conducted an extensive field campaign to survey DVM of zooplankton in Patagonian Fjord combined with various physical parameters. The approach is correct, but the interpretation of

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the data, as well as the experimental design is not suited for the purpose. I have read three other referee's comments and I totally agreed with those comments. The context is poorly organized and too many references are missing from the reference list.

We have taken into account all the referees comments (R1, R2 and R3) in order to enhance the manuscript quality. We believe that as a result the manuscript has improved tremendously, and we are grateful for the time of all of the reviewers in helping to better our manuscript.

Turbulence measurements are conducted with two different instruments, but no data for SCAMP was presented in the text.

Figure 10 was comprised of data from two microstructure profilers. In the left panel (Figure 10a, c, and e) we used the VMP data and in the right panel (Figure 10b, d and f) the SCAMP data was presented. In the revised version of the manuscript, after taking into account all of the reviewers comments, Figure 10 was eliminated from the text and an improved figure 10 was included that only uses the VMP-250 data.

The description of SCAMP should be deleted. As I mentioned, I agree with the other reviewers' comments, I am not going to repeat the same points.

We eliminated all information and data from the SCAMP.

But one of the major fraud should be repeated.

No fraud occurred in the manuscript.

38 KHz is too low to detect zooplankton. In general, a combination of 38 KHz and 120 KHz is useful to distinguish between zooplankton and fish.

We clarified the methodology as a result of R1 comments and new text was inserted in the revised version of the manuscript.

Another important error that was not mentioned in the other reviews is that the dissipation rate estimate reached an upper bound at  $1.5 \times 10^{-5}$  W/Kg since, probably, they

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did not correct the unresolved variance in high wavenumbers (see Fig.10f). But they are reporting that the dissipation rates around sill are nearly  $10^{-4}$  W/Kg. I see no reason to support this number. Also I do not see  $Kho=10^{-2}$  ( $m^2 s^{-1}$ ) in Fig. 11c. All values are below  $10^{-2}$ !

Following the method of Lueck (2013) all of the shear estimates are cleaned, and noise is eliminated. The variance in high wavenumbers can be resolved. We eliminated old values of dissipation rate of turbulent kinetic energy and  $Kho$  throughout the text. The new values were added to the manuscript.

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