

Interactive comment on “Temporal variations of zooplankton biomass in the Ligurian Sea inferred from long time series of ADCP data” by R. Bozzano et al.

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We would like to thank the reviewer for carefully reading the paper and his/her important suggestion about the improvement of the content.

We understood that the reviewer, discussing about signal-to-noise ratio and referring to Figure 3, is wondering about the significance of the variations (monthly minima and maxima with respect to the monthly average values). The uncertainty of the estimation of the monthly average values is below 0.15, 0.18, 0.12 dB re (4pim)-1 for the three deployments, respectively. Hence, this allows us to trust in the significance of even small variations of monthly averages. Furthermore, monthly minima and maxima values of

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the backscatter at 40 m depth shown in Figure 3 are evidences of the zooplankton migration as also shown in Figure 7.

More specific comments follow.

- Page 1369, Lines 18-20. We rephrase the rather unclear sentence.
- Page 1370, Line 3. A figure of the investigated area will be added to the final paper.
- Page 1371, Lines 11-13 Lines 21-27 Lines 14-20 Lines 28-5 (Page 1372). We agree on the reviewer note about rearranging the sentences as suggested.
- Page 1371, Line 15. This sentence has been modified as follows “In addition, due to the particular hydrographic conditions of the area, three main assemblages may be defined: one linked to the divergence zone of the basin, one associated to the periphery of the divergence and the latter with the eastern continental shelf (Licandro and Icardi, 2009). Different mesozooplanktonic taxa describe each assemblage, being copepods of Scolecithricidae family and appendicularians of genus *Fritillaria* dominant in the divergence, while *Clausocalanus furcatus* and *Paracalanus* sp. mainly inhabit the eastern continental shelf. The third assemblage is mostly characterized by ostracods and the copepods *Neocalanus gracilis* and *Clausocalanus paululus*.”.
- Page 1372, Line 22. “Warming and salinification” processes were observed in winter 2004-2005 when also dense water formation occurred in the basin. The words “Those years” refer to this period of time (winter 2004-2005). We slightly reformulate the sentence to make it clearer.
- Page 1373, Line 20. We rephrase the sentence to better express that dense water in the basin was observed from February to April 2006 and the unusual mixed layer depth of 2000 m occurred in the first days of February 2006 (ref. to Martin et al., 2010).
- Page 1374, Lines 10, 11, 12. According to the suggestion of the reviewer we modify the sentence.

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- Section 2.4 We agree about the observation regarding the definition of R (slant range), thus we introduced a reference to the equation (3) and (6) as suggested.
- Page 1378, Line 12. Figure 3 was modified, see below. According to referee's suggestions, we re-discussed results provided by this figure.
- Page 1378, Line 14. We removed the misspelled word "distribution".
- Section 3.3. In our opinion second (Lines 12-15) and third (Lines 16-25) paragraphs are related to the first one since they deal with the zooplankton behavior between sunrise and sunset and vice versa.
- Section 4. We changed the title of the Section as suggested.
- Page 1384, Line 23. The reference to "September 2006" was wrong and it is now replaced with the correct one (September 2005).
- We changed the fonts of all the figure labels and, when possible, we made line thicker.
- Figure 3 has been modified: monthly average time series were detrended to emphasize the variations, uncertainties in the estimation of the monthly average values were added as error bars, and time axis of all subplots were aligned. Monthly minima and maxima time series were aligned and provided as separate subplots.
- Figure 7. As suggested by the reviewer, Figure 7 has been modified aligning the three time axis.
- Figures 9, 10. We specified the depth to which the plots refer to both in the main text and in the caption.

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