

Interactive comment on “The temporal variability of oxygen inventory in the NE Black Sea slope water” by Alexander G. Ostrovskii et al.

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General comments

The authors account for an extremely interesting issue of short-time variations in the distribution of oxygen in the Black Sea. They present and analyze the oxygen dynamics on the timescale of hours-to-days. This has never been done for the absence of observational data until now. Both the applied technique and acquired data are unique making the work exceptionally interesting and important. The authors have identified oscillations in the distribution of oxygen and other oxygen-dependent features, for example the onset of hypoxic conditions, on the timescale of ~17 hours and about 5 days. They have concluded that this might be vitally important for benthic communities at the

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shelf edge experiencing periodic abrupt loss of oxygen.

The authors have also traced variations in the stock of oxygen in the water column for about 2 months of their experiment. They have revealed the influence of lateral advection on inventory of oxygen in the cold intermediate layer due to late-winter ventilation.

As far as I see, all observational results and achieved conclusions are new and scientifically important. This makes me sure that the manuscript is worth been published, but after extended improvement. There are, unfortunately, two major disadvantages in this manuscript: its structure and English.

I will make almost no specific comments on English, as this is not my first language, but I definitely see that English must be improved. The current version will not only irritate readers, but also often mislead them. I see in some places that the text is written in Russian by English words making hardly possible to understand the very brilliant results and discoveries.

Where it comes to the structure, the manuscript needs it badly. The major issues are not listed at the end of introduction. Instead, it says that “this paper considers these issues by analyzing a unique data set that describes the vertical profiles of oxygen content, temperature and salinity of water, and speed and direction of currents, as well as acoustic backscattering on suspended 5 matter.” And “these issues” mean anything and everything the authors do with their observational data in section 4 “Discussion”. Only concluding remarks suggest a better-structured text with observations and discoveries on the oxygen dynamics connected to water dynamics and hydrologic processes. Still, periodic oscillations in the distribution of oxygen remain identified but explained. And the final paragraph suggest some conclusions on the low oxygen content in the near-bottom layer that come from nowhere but need to be discussed in the previous section.

Thus, my final general comment that the suggested manuscript is unique in data and discoveries, but it needs to be improved in its structure and English.

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Specific comments.

Consider to change the title for “The oxygen dynamics at the shelf edge of the Black Sea on the timescale of hours-to-days”.

Consider to delete the last sentence in the abstract because it is hardly the major and final result of this work.

Page 1, line 15: Unless I have missed it, any explanation or justification of the chosen depth of 30 meters has not been suggested in the text.

Page 2, lines 1-2: This sentence comes from nowhere. Suggest a reference or some justification.

Page 2, lines 5-6: CIL and other specific for the Black Sea features need an explanation or references.

Page 2, line 11: The referenced publication by Oguz et al. is good but it is about modeling. Look for the recent publication by Kubryakov and Stanichniy or recently published data by Yunev et al., Mikaelyan et al. based on observations.

Page 3, line 5: I do not see any reason for discussions of global warming in this manuscript.

Page 5, lines 20-24: More explanations are needed.

Page 5, line 31: If I understand it correctly, the currents are of opposite directions in the layers above sigma-theta 14.5 and below it. If it is true, it requires an extended discussion on the influence of this feature on the oxygen distribution.

Page 6, lines 8-17: This paragraph is very hard to understand for English. For example, I believe the first sentence should be “the oxygen distribution versus depth is exceptionally dynamic”. The other sentences are equally vague in the present form.

Page 6, lines 23-26: This justification for hypoxia should be somewhere in Introduction

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section.

Page 8, lines 5-8: I do not see any reason for this paragraph here.

Page 9, References: I believe there are too many references for publications by the authors of this manuscript. There usually should be up to 25% of them, but not more.

Figure 1. This figure is mentioned once and has never been discussed. Consider deleting it.

Figure 3. This figure is very complicated and hard to understand or follow.

Figure 5. This figure is mentioned once and only for the sharp oxycline. I do not see any reason to plot several profiles and to apply 20 μM shift.

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