

Interactive comment on “Mean dynamic topography of the black sea, computed from altimetry, drifters measurements and hydrology data” by A. A. Kubryakov and S. V. Stanichny

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We would like to thank you for reviewing of our paper and your comments. We provide below our replies to your comments.

Comment: 1. The novel aspects of the study are not clearly presented. Although there are some similarities to the referenced papers (and some other papers that are not referenced), the calculation of the MDT in this paper is somewhat different. It provides estimates along tracks without the need for the background estimate. This can be added as a novel aspect of the study in addition to the calculation of a new MDT in the Black Sea.

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Response: Thank You for your kind comment, we mentioned this aspects in the conclusion (in new version)

Comment: 2. Page 702 – Title: It should be “Black Sea” instead of “black sea”.

Response: Thank You, we already mentioned it and corrected this misprint.

Comment: 3. page 705, Section 2.2.3 Why is the depth of 500m chosen?

Response: Black sea is strong stratified basin, main seasonal changes of stratification are occurred in the upper 100 meters and strong mesoscale eddies typically disturb upper 200-400 meters. That is why, density variance and current velocities is negligible in deeper layers.

Comment: 4. Page 706, Section 2.2.4. The description of the CMDT is insufficient. It is the main data set for the comparison and must be described with much more details: What are the parameters of the model set-up (model, resolution, time integration length, etc.) ? How is the T/S climatology obtained (data sets, OA scheme, radius of correlation, etc.)? Is the model able to generate any of the observed eddies?

Response: We added some information about the model. In some words, it is 3D non-linear primitive equation model, developed in Marine Hydrophysical Institute. We add a link on this model. We should say that we just used the results obtained in referenced paper (Knysh V.V., Demyshev S.G., and Korotaev G.K: Method of reconstructing the climatic seasonal circulation of the Black Sea on the basis of assimilation of hydrologic data in models (in Russian). Marine Hydrophys. J., 2, 36-52, 2002.) So all information is in this paper. Upgraded version of this model is used today for operative forecasting of the Black Sea circulation, see in English in OSD (Development of Black Sea nowcasting and forecasting system G. K. Korotaev, T. Oguz, V. L. Dorofeyev, S. G. Demyshev, A. I. Kubryakov, and Y. B. Ratner Ocean Sci. Discuss., 8, 917-954, 2011, <http://www.ocean-sci-discuss.net/8/917/2011/osd-8-917-2011.pdf>)

Comment: 5. Page 710, line 15. The eddies should be shown in a figure, because

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those who read the paper are not always experts on the Black Sea dynamics.

Response: We changed this part, for better understanding. To answer on your comments: Batumi anticyclone is on the south-east, Sevastopol in the north-west, west of Crimea, Bosphorous is in the south-west of the BS, Kizilirmak – south-south-east, Sakarya – south-south west, Synop and Trabzon on the south of the Black Sea; Crimean anticyclone on the north; and Kali–Akra Eddy on the north-west coast. You can see geographical distribution of these eddies in this paper: Korotaev, G., T. Oguz, A. Nikiforov, and C. Koblinsky: Seasonal, interannual, and mesoscale variability of the Black Sea upper layer circulation derived from altimeter data, *J. Geophys. Res.*, 108(C4), 3122, 2003

Comment: 6. The study is almost completely self-referenced without addressing other methods for the MDT estimation. Only a very similar method is referenced. The introduction should at least give references to other possible methods for the estimate of the MDT.

Response: We added links on some other works and methods. It should be mentioned that in the article we described and referenced in introduction all known methods, which were used for Black Sea MDT estimation (climatic data and model simulations).

Thank a lot for your kind comments and interest You show to our paper.

Interactive comment on *Ocean Sci. Discuss.*, 8, 701, 2011.