

Interactive comment on “Estimation of geostrophic current in the Red Sea based on Sea level anomalies derived from extended satellite altimetry data” by Ahmed Mohammed Taqi et al.

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General Comment :

In this article the authors use data from Jason-2 to extend SLA observations from AVISO towards the coasts of the Red Sea. Altimetric products from AVISO are commonly used to describe the open ocean dynamics but their resolutions are coarse near the coasts. The combined satellite dataset is validated with three tide gauges situated along the western coast of the Red Sea and with geostrophic surface velocities estimated from CTD. This new merged satellite product shows good agreement with the other available dataset and allows the authors to have better observations of the SLA

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along the coasts.

Once validation of the products, the authors describe the monthly climatological evolution of the the SLA and surface currents, exhibiting the evolution of mesoscale eddies, in size, position and rotation. A month to month analysis of the surface fields describe the observed eddies and link them to the structure previously studied in the scientific literature.

I think this article is well written, the merged dataset allows us to understand the climatological circulation in the Red Sea, where previous satellite dataset allowed only a partial coverage linked to the geography of the basin. Still it lacks some informations of the dataset used to validate the data and the justifications of some diagnosed.

Nevertheless I felt that the last part of the article did not emphasize the main contribution of this study : the calculation of surface currents and SLA along the coast. As I wrote above, the authors did a good job comparing their results with previous studies, and where they agree, but it would be important in my opinion to add informations on where it provides new informations, particularly along the coasts. The conclusion is a little short, and adding these informations will help wrapping the article nicely.

I suggest accepting after minor corrections.

Specific comments :

Methodology : 1/ The SLA from AVISO gives measurements offshore, while the FSM-SLA method extends these measurements toward the coasts. I wonder how are the discontinuities between dataset removed or smoothed ?

2/ On figure 2 the authors show the correlation between the AVSIO and FSM data, how are they calculated where the AVSIO dataset does not provide measurements (again along the coast) ?

Results : 1/ I suggest separating this section in two part, a first with the validation of the method (down to line 17), and a second with the analysis of the SLA.

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2/ About the CTD : on figure 4 the authors display different part of the Red Sea at different periods comparing AVSIO and the FSM-SLA. What are the justifications for these specific area and periods. I think providing a quantitative analysis would help validating the approach.

3/ The visibility of the geostrophic currents and eddies name of figures 5 and 6 have a low visibility. As they exhibit the main results of the study I suggest remapping them by adding a light opaque filter on the SLA and then adding the arrows and names. The same goes for figure 4 where the arrows are difficult to see.

4/ Figure 7 wrap up the paper with a schematic representation of the currents, but, as the authors state, the monsoons have a strong impact on the Red Sea, particularly on its southern edge. I suggest adding a schematic representation for the winter and summer seasons in order to point out the differences in circulations.

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