

Interactive comment on “Surface circulation in the Eastern Mediterranean using drifters (2005–2007)” by R. Gerin et al.

Anonymous Referee #2

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Overall comments:

The article describes the main surface circulation features of (the southern part of) the Eastern Mediterranean Sea depicted from tracks of 97 drifters deployed in the area during 2005–07. The manuscript includes important information, valuable for describing the spreading of Atlantic Water (AW) in the Ionian and Levantine basins and the regional dynamics of the surface circulation. This kind of information is important for understanding the pattern of the regional circulation and its seasonality, especially in an area where observations are very sparse in space and time, but the results are mostly descriptive and of statistical character. The discussion about mechanisms involved is minimal (and in some places not really convincing). I find the paper important and interesting for publication, but the authors can greatly improve it through reorganizing

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and extending the discussion of regional dynamics.

General comments:

The description of the atmospheric forcing pattern (during the experiment or at least the climatological pattern) is absent from the manuscript. The wind effect is mentioned in several places in the manuscript without describing the wind pattern (and its seasonality) in the area. Other processes affecting the surface circulation pattern, such as topographic effects (obvious in some cases), is not discussed.

The discussion about the mechanisms involved in the eddy generation and evolution is very weak. This is also evident in the discussion of the role of eddies in the Mid Mediterranean Jet region. Although I tend to agree the mechanism of eddies detached from the boundary current is very important for carrying AW northwards, the article does not give more information about eddy translation and variability (through the overall and individual drifter tracks).

Comments about “current reversal/fluctuation” are not thoroughly proved in the article, as opposed to eddy variability/eddy field. The part describing the first ten days trajectories (page 533/line 12 – page 534/line 14) does not seem to contribute to the discussion of the surface circulation. The authors should either remove this part or explain the necessity of this analysis and the major findings.

Did the drifters deployed record other parameters (e.g. surface temperature)? If so, it would greatly benefit the article to include the recorded water characteristics, especially since the main goal of the article is tracking the spreading of AW in the Eastern Mediterranean. If not, the reader should not be directed to a dataset (page 532/line 26), but a plot of the regional water characteristics should be included.

The effect of missing drogues is not clearly established. Although a correction is applied (and I know the authors are experts in this field), it should be mentioned somewhere in the manuscript what are the overall differences in the results after removing

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this part of the data set.

A map of the geographical nomenclature and the general surface circulation patterns described in the introduction (and later in the text) could be very helpful.

Finally, the Conclusions section is very weak (it is actually a “future work” section). The authors could summarize what they mean by “improved or novel description of the surface circulation”, by pointing out improved/novel findings in the region.

Specific comments:

In the description of Ierapetra and Pelops eddies (Page 528/line 21) please add reference.

Please provide reference for the “POEM diagram” (Page 528/line 24).

The authors mention that “in the Levantine sub-basin, no clear seasonal signal was expected to dictate periodic releases” (page 531/line1). Can they explain and prove that?

The MKE/EKE fields presented in page 538/line 4-9 should be interpreted and discussed.

The authors mention that the circulation pattern “can be compared to the mean circulation already described by Malanotte-Rizzoli et al.”. What are the findings from this comparison?

Figures 7-9 are “very busy” and difficult to follow. A suggestion could be to split the figures in subareas, where the reader could follow easier the results and comments.

Interactive comment on Ocean Sci. Discuss., 6, 525, 2009.