

Interactive comment on “Operational analysis of the circulation and shelf-slope exchanges in the continental margin of the northwestern Mediterranean” by A. Jordi et al.

Anonymous Referee #1

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This paper presents one of the expected typical outcomes from the MFSTEP modelling system: how details of the circulation in a relatively small Mediterranean region can be analysed by using a high resolution model nested on the coarser global MFSTEP model. I think it is a good example, presented in a well organised and detailed way, and highlights an interesting specific aspect: the shelf-slope water exchange in an area indented by many submarine canyons.

The manuscript is then very well suited for this OS MFSTEP special issue and I recommend publishing it with only minor corrections.

I don't understand why the authors include the word “operational” in the title, as the

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analysis is made for a one month period without any implications for near-real-time or operational data assimilation aspects. I know that this nested modelling system is designed for operational runs, but this aspect is not relevant for the subject of this paper. I would simply remove this adjective.

The introduction is adequate and provides succinct information on the major bathymetric and circulation features of the study area. I would like to know how the quantification of 60% of slope area being cut by canyons has been made. If this area was exactly marked in fig. 1 we could maybe see that 60% is occupied by canyons, but now it is not so easy.

The description of the model is very informative, both for the model characteristics and how it has been implemented in this case. I miss here a justification for the 30 days length and December period being chosen in function of the objectives of the paper. Is this not relevant, as the authors just wanted to show how the system works? Is the duration of the period the best suited to analyse shelf-slope exchange?

The results section is correct, with several examples on the kind of information that can be provided by this model application, and comparisons to other sources of data to confirm the degree of confidence of the model results. The computation of the shelf-slope exchange is a relevant scientific contribution.

I list below some small comments:

- Maybe more references, other than the general Send et al., could be provided for in situ information
- In pg. 591, line 24, there is a “by” that should be removed
- Was the mushroom-like structure in fig. 5 observed in contemporaneous SST images? This would be a very strong point in favour of the realistic performance of the model
- The reference to Argo data would be better done through MedArgo (a MFSTEP com-

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ponent) and the Coriolis server where these data can be found

- It seems that a typographic error has been introduced in equation 1. As it is now it has no sense: $U_{cross} = U \times 1$

- The statement “assuming a similar magnitude for the entire winter” should be better explained. Does it mean that effective exchange during winter is reduced to December? Or the rest of the winter has an overall exchange equal to December exchange, then winter = 2 x December? What is the reason for this?

Figures are informative and well prepared. Please correct some grammar errors at the end of Fig. 9 caption. I think that, taking advantage of the on line OS publication, more figures could have been added, as some snapshots of model outputs that should provide the appearance of mesoscale structures in the density and circulation (an important point for a high resolution model) instead of presenting only the smoothed average in fig. 3

As a summary, I consider this is not a high impact paper but a perfect contribution from the kind of work MFSTEP has been performing

Interactive comment on Ocean Sci. Discuss., 3, 585, 2006.

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