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Interactive comment on “Assymmetric eddy populations in adjacent basins – a high resolution numerical study of the Tyrrhenian and Ligurian Seas” by R. M. A. Caldeira et al.

Anonymous Referee #2

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This study aims at studying the role of eddies in the Ligurian-Provencal and Tyrrhenian basins, with a special interest on the comparison between eddy populations in both basins. The study relies on a few satellite data, numerical outputs from two different models (operational MERCATOR product and a ROMS configuration) as well as several inputs from other related articles. Significant differences are found concerning the eddy distribution, dynamics and life-time when both basins are compared. An additional discussion part shows interesting similarities between some previous theoretical work and the present realistic study. A final section aims at discussing the eventual impact of such asymmetric dynamics on the biology.

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My general comments are : - The English does not reach the suited general standards for such publication, this is not the case for all sections but for a too significant number of the important parts. In addition, too many sentences are incorrect or inappropriate or badly phrased, leading to confusion or misunderstanding. References to some figures seem to be sometimes wrong.

- Most of the figures are too small, do not feature any units and sometimes are not even recalled in the main text ? Some could be merged in order to avoid confusion, and some could be deleted as they do not bring extra-clarity to the text.

- The part concerning the model validation is incomplete as from the start few information are missing concerning the model configuration itself. This part is also not clearly emphasized when compared to the most important part: the eddy activity in the 2 basins.

- The comparison between MERCATOR and ROMS simulation is not relevant, especially when considering the major differences of set-up between the NEMO Z-level and ROMS sigma level configurations. This should be either less discussed and used because of the strong differences or more developed in order to bring relevant pieces of information for discussion.

- the theoretical part is very promising. However, as this could be one major interest of your paper, it should be much improved , in terms of accuracy and development. - The final part on the biological impact is interesting but very light! It should then either be developed or proposed as an extra discussion in the conclusion.

For all these reasons, I suggest a process of MAJOR REVISION. Generally speaking this paper features promising ideas but it should be re-targeted to the most relevant issues the authors want to raise in order to reach publication standards. The general unfinished presentation (English, figures, sections organization) strongly penalizes the overall impression of this paper.

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Some specific concerns are reported below, page by page.

P3523: L17 : "Hard" -> difficult.

And what about HF radar ? shouldn't you mention them ?

L18: is is however more and more sampled ! MOOSE for example ?

P3524: L10 to the end : several sentences need to be rephrased.

P3525: L1: lodgedevelop

L15 to 26: does this part deserve to be that long...I don't think so.

P3526: Misspelling : L1 : temperature

P3527: L2: verb is missing to get a clearer sentence.

L7 : as you talk about Boussinesq, what about hydrostatic approx, non-divergence, etc..

L12: "was 1/32 is (3km)" : this is confused English.

P3528: L6 to 7 : rephrase ! "...are needed to correctly reproduce .." would be more suitable.

P3529: L1 to 2 : English

L6 ...: KE is computed with AVISO, but AVISO only gives geostrophic velocities . This should be explained to enhance the comparison validity between models and satellite data ! L14-16: is this information relevant ?

L22 to 26 : 1) one has to define the MLD criteria (therefore the one used in your ROMS version !)

2) What is the order of magnitude ? your figure does not have a very appropriate color scale ?

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P3530: L3 : "in front" "along" the Gulf of Lions shelf slope is more accurate.

L4 : "intense " ...Please find another word.

L22- 24 : already said previously . Pick one location to put this information.

P3531: L12: "Also" is not the correct word to start this sentence. Rephrase.

L26 : but as you can see the SST along the Gulf coast is in good agreement which means that mixing and atmospheric coupling is good for shallow waters with your configuration but you cannot say it is as good along the shelf slope. This was the sort of thing I would have expected to see in the text. For this part, you do not mention figure 5a, so is it necessary or is it a mistake ?

P3532: L1 : they are roughly corroborated ! Some are even opposite in direction !! agree there is an overall good agreement, but your sentence is way too inaccurate .

L22: denser -> a more important, as well as -> and

L24 : at -> along

L27 : on -> in

L28: 10 Sv : where did you get the figure ?

P3533: L1 : anyway, how many levels do you usually have between 0 and 10 m with ROMS ?

L11- 13 : I do not understand this sentence, however it appears important ?

L14- 17: Is it really surprising ? This tendency is expected when resolution is increased.

L20- ...: and is there not in addition a vertical resolution problem for the mercator grid ? Plus the fact that the sigma and Z vertical grids are expected to produce differences . This should all be much discussed.

P3534: L5 ...: The figure 10 is not clear.

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L16 : enlarge -> grow

L18 : in horizontally -> for a horizontally..

P3535: L6 : These idealized approaches usually study

L8 : as well as to help guiding

L15 : became a discussion : strange expression ?? to be changed.

P3536: 24 : "en route" ?

Finally : for all the figures : too small, too many , not a single one with the units (!!)

Fig 7A : you have even left the disk address of your figure . And this does not help you as for the lower panel, you say in the caption "500m depth" and the disk address is ../1000m !

Interactive comment on Ocean Sci. Discuss., 9, 3521, 2012.

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