**Ocean Science
Discussions**

Interactive comment on "A high resolution free surface model of the Mediterranean Sea" *by* M. Tonani et al.

M. Tonani et al.

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We thank the reviewer for pointing out missing elements in our model solution analysis. We think we have answered all the comments and the paper is improved. We start with answering the specific comment and then the technical corrections. A revised manuscript has been submitted to OS.

SPECIFIC COMMENT: (i) Figure (3) shows the model kinetic energy for the two runs P and I. It is not clear why the kinetic energy of Run I for January 1, 1997 is equal to zero. If the Run I is initialized with the fields from the Run P after 6 years of integration, one would expect that the kinetic energy on January 1, 1997 in Run I will be equal to the kinetic energy at the end of year 6 in Run P, which differs from zero.

Answer: There is an error, the run I as not been initialized by the fields from the run P

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after 6 years of integration. Both the experiments, P and I, have been initialized by the climatological fields of T and S and zero velocity.

(ii) Authors discuss in details the relatively low summer steric component of model sea level and the reason for the model ssh error. There is however another difference between the data and model curves on Fig. 9. The ssh maximums and minimums in the model solution are in most of the years shifted in time with 1-2 months from the corresponding maximums and minimums in ssh data. Moreover, one can observe in some of the years two local minimums in the model ssh during the winter months. The ssh data, on the other side, always have just a single winter minimums. It is interesting to know the authors interpretation of this difference between the timings of maximums and minimums in the model and data sea surface heights.

Answer: We think we don't have enough elements to properly comments this differences. A dedicated study is needed in order to investigate better this aspect. Some years, like 2000 the mean ssh from the model (panel b, figure 11) shows 2 minimums is winter as well the satellite SLA (panel c, figure11). The comparison between the model and satellite SLA (panel c)) does not show this characteristic in the model signal because it has been lowered by the steric component. We think that this is a preliminary study and we can not speculate on this results.

TECHNICAL CORRECTIONS:

(i) There are typing errors in the formulas (13), (14) and 15.

Answer: Corrected.

(ii) The sensible heat flux H is missing in the expression about surface heat flux (24)

Answer: Corrected.

(iii) Fig. 3: The time period of averaging of the kinetic energy should be mentioned in the caption.

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Answer: The caption has been corrected. The time period of averaging of the kinetic energy for PE is ten days and for I is one day.

(iv) The units on the upper panel of Fig. 5 are missing

Answer: Corrected.

(v) The explanation the lower panel of Fig. 7 in the text (line 18, page 226) says it shows "the wind stress and the wind curl superimposed with the eastward transport". At the same time there are only two curves on the lower panel of Fig. 7.

Answer: Figure7 has been corrected.

(vi) Fig. 10. It would be interesting to present also a plot of model - ARGOs density rms in the blank lower panel on the right.

Answer Thanks for the observation. We have added a panel with the plot of model-ARGOs density rms and we have commented this plot in the text.

(vii) Please use characters a), b), c),.. for different panels in all of the plots. In this way,it would be much easier to refer the figures in the text.

Answer: Done

(viii) Most of the captions need to be improved and to provide precise information about the figures. Authors provide important information about the plots on the top of each panel of the figures which in many cases is not readable. This information should be present in the captions of the figures.

Answer: All the captions have been rewritten.

Interactive comment on Ocean Sci. Discuss., 4, 213, 2007.