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Interactive comment on “Altimetric sampling and mapping procedures induce spatial and temporal aliasing of the signal – characteristics of these aliasing effects in the Mediterranean Sea” by M.-I. Pujol et al.

M.-I. Pujol et al.

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Response to Salvatore Marullo (Referee #2)

General Comments:

The paper presents a detailed (may be too long) description of problems related to the spatial and temporal aliasing of altimetric measurements in the Mediterranean Sea focusing on the inability of the present altimeters configuration to fully resolve periods less than 30-40 days. The discussion on the possible origin of this problem is well documented and gives an interesting view of the present limits, but also of the poten-

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tial, of these very useful satellite measurements. As a general comment this paper is interesting because it deal with an important issue for Mediterranean Sea dynamic studies and modelling activities that, always more frequently, make use of these data. It will also be interesting to mention the possibility to use, in the future, a wide-swath altimeter. Could this new type of instruments contribute to reduce the spatial aliasing effect? In my opinion the paper merits to be published with a very minor revision based on the following specific comments.

Author : The Referee can note that the revised version was lightly reduced following suggestions of Referee #1.

Specific comments:

Section 2.2: 1) what is the difference (if it exists) between the basic processing of the altimeter data proposed by this paper and the standard products available in AVISO?

Author : The AVISO disseminates product from Ssalto/Duacs operational chain. The reanalysis (delayed-time data) available on AVISO web site takes account of the parameterisation suggested by Pujol and Larnicol (2005) and Carrère and al. (2007), also applied in this study. However, this study suggests that the long-wavelength signal correction could be improved in the Mediterranean Sea. At the moment, the operational product does not consider this improvement since deeper investigation of the consequence on the entire signal restoration is needed.

Pujol, M.-I. and Larnicol, G.: Mediterranean Sea eddy kinetic energy variability from 11 years of altimetric data, *J. Mar. Syst.*, 58, 121-142, 2005.

Carrère, L., Volkov, D., Le Traon, P.-Y., Schaeffer, P., Boone, C., Faugère, Y., and Gaspar, P.: Reducing the aliasing of the high frequency signals in altimeter data: empirical and model-based approaches, *J. Mar. Syst.*, in review, 2008.

2) Why a seven-years mean SSH was computed instead of a longer time mean?

Author : The use of the 7 years mean is essentially link to the users and especially

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operational center. We keep a 7 years mean in order not to impact these users. Of course, the ideal would be to use the full time-series temporal mean. However, the computation of a new mean SSH does not come down to make a mean of the altimetric data available, and laborious works of intercalibration and validation are needed : we need 4 homogeneous and calibrated mean SSH corresponding to the 4 kinds of available satellites. However, each of them covers a different temporal period. As the mean SSHs used should not directly impact on the part of the signal studied, we chose to use the existing mean SSHs, yet validated and consolidated.

Section 2.3: second line. Why drifters?

Author : It is an error. The data considered are tide gauge data.

Section 3.2: I have some problem with the colour bar of figure 1. The mean value of the western basin seem to be higher then 7 cm² (may be something more close to 9-10). Similarly in the eastern part values appear higher than 9 cm². Does the very high values of the north Adriatic Sea participate to the estimate of the mean?

Author : An error occurred since the figure presented does not correspond to the signal that the author describes in section 3.2. Actually, the figure presents the variance of the entire signal simulated by MOG2D (high and low frequency signal). The higher values than discussed in the text are due to the contribution of the low frequency component. The figure was replaced in order to correspond to the high frequency component of the MOG2D signal, as discussed in the text.

Section 3.3: Being the higher revisit frequency 10 days (topex and Jason) why the maps are generated every 7 days? Could the authors justify the choice of this particular time interval?

Author : As this work is part of the operational altimetric product improvement, the 7-days frequency was choose in reference of the frequency of the operational output. Merging data from 2 different altimeters allow us to produce maps of SLA with higher

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frequency than Topex and Jason revisit frequency. However, temporal radius used for the selection of the data used in the construction of weekly maps is fixed to 10 days. This value takes account of the temporal scale characteristics of the basin, but is strongly constraint by the revisit frequency of the satellites. (cf Pujol and Larnicol, 2005)

Section 5.2.2: having spent so much in explain all the details of the various corrections and sensitivities the explanation of the observed local differences (last sentence of the section) looks very short and quite speculative. May be some problem with altimetric measurements near the coast and the need of a specific processing for near coastal areas should briefly discussed.

Author : The section 5.2.2 was removed in the revised version. However, the problematic of coastal altimetric was briefly discussed in section 5.2.1 (penultimate §).

Section 5.3: In this section structures like Ierapetra or Pelops are mentioned. I well know all the places and the cited dynamical structures but I can imagine that for those reader that are not so familiar with the Mediterranean Sea a maps with locations names and structures position could help more than a citation.

Author : A figure was added (figure 1 in the revised version).

Interactive comment on Ocean Sci. Discuss., 4, 571, 2007.

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