

***Interactive comment on* “The assessment of
temperature and salinity sampling strategies in
the Mediterranean Sea: idealized and real cases”
by F. Raicich**

Anonymous Referee #1

Received and published: 6 July 2006

This comment was made based on the OSD print-version of the paper.

General Comments

This paper addresses a scientific issue on the assessment of ocean sampling strategies, which is highly relevant to the optimization of ocean observational networks and operational ocean forecasting. The author successfully evaluated the quality of a variety of temperature and salinity observational networks (including both ideal and real sampling strategies) in Med. Sea by using a classic twin-experiments OSSE method. Normally it is not a trivial work to obtain significant results by using the Observation System Simulation Experiments (OSSEs), due to large amount of computation on a con-

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

siderable number of experiments with/without data assimilation, complexity of choosing sampling strategies and the errors existed in the model and assimilation schemes. The success of the OSSEs in this paper may be due to following reasons:

1. The data assimilation method (the multivariate OI) used in this paper has a medium-level complexity but very robust
2. The idealized sampling strategies were originally designed by MFS, important geographical areas are covered by these sampling strategies
3. The model is robust and in a resolution which can be used to resolve medium-scale eddies and meanders.
4. The effectiveness of the index (i.e., relative error) for evaluating the OSSEs.

The title of the paper clearly reflects the contents. The abstract is concise. The language is fluent and precise. The description of the work is clear, and sufficient references on OSSEs are referred. However, in the sampling strategy design field, statistical assessment and design methods have also been widely used. It is a regret that the author didn't mention it.

Substantial conclusions have been achieved on the assessment of real VOS, SRGO, M3A buoys and Gliders sampling strategies and ideal VOS and M3A sampling strategies. However, these results are limited by the model and assimilation methods and parameters used. The author may discuss more about these limits. Firstly, the forecast error covariance radius was chosen as a constant (45km). Such an option actually enhance the importance of the medium-scale phenomena in the forecast. The actual forecasting covariance error is inhomogeneous and may have a large scale pattern. Secondly, the OI method does not fully utilize the temporal evolution information in comparison with adjoint method. For the real sampling strategy, since ARGO and M3A provide more temporal evolution information than the VOS, the real sampling OSSE results may be influenced by using an adjoint method.

[Full Screen / Esc](#)[Printer-friendly Version](#)[Interactive Discussion](#)[Discussion Paper](#)

It is recommended that the paper should provide more information on how good the model works in the Med. Sea (i.e., the model's ability to simulate major features of the Med. Sea).

Some figures should be re-made (see following specific comments).

Specific comments

1. How is the initial condition of the control run specified, and how is the difference of initial fields between the control run and assimilated runs and free runs generated?
2. It is better to distinguish the Western and eastern Med. Sea by using a line in a figure, rather than the sub-regions covered. (p.131, line 25)
3. p.132, line 10. does the model use relative humidity and cloud cover from ECMWF forcing? What about river runoff?
4. There is a miss-match between Fig.1 and Fig. 13b. Is this due to that Fig.1 assimilates observations while Fig.13b is an OSSE? If so, this means OSSE results on the salinity in winter time may only be trusted to a certain extend. Please give more explanation on this.
5. Method BT may not be a good technique to be used in OSSEs, since in Fig.1, BT results are worse than UT in L1 and L3.
6. In Fig. 3, it is not easy to distinguish tracks 5b and 6, 7a, 7b.
7. The captions of Fig. 8-9 should mention if the figures is for temperature or salinity.
8. p.140. line5, LIW, please give its full name.
9. Ticks in Fig. 12-13 (i.e., the notation for different types of lines) are wrong, please correct them.

Interactive comment on Ocean Sci. Discuss., 3, 127, 2006.