

## ***Interactive comment on “On the mesoscale monitoring capability of Argo floats in the Mediterranean Sea” by Antonio Sánchez-Román***

**Anonymous Referee #2**

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The authors present an analysis of Argo float deployment strategies in the Mediterranean Sea. They generate synthetic Argo profiles using satellite altimetry maps based on statistical parameters derived by comparing altimetry maps to actual Argo profiles. Field reconstruction techniques are then used to produce horizontal altimetry maps from synthetic profiles sampled at different horizontal resolutions. Errors between original and reconstructed maps are then calculated to assess the impact of reducing the horizontal spacing between Argo floats.

There is one major issue that the authors need to consider before the paper is published. The analysis procedure described in this paper is not a rigorous OSSE. Rigorous OSSE procedures have been developed in the meteorology community and are only recently being transitioned to the ocean. A recent paper of interest by Hoffman and Atlas (2016) that describes rigorous OSSE procedures can be found at the following

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link:

<http://journals.ametsoc.org/doi/full/10.1175/BAMS-D-15-00200.1>

Click on the 'full text' tab for the main paper and on the 'supplementary materials' tab for the checklist for validating an OSSE system and executing rigorous OSSEs.

These comprehensive OSSE procedures have been developed to insure that the resulting impact assessments are credible and unbiased. A key step toward validating an OSSE system is given in the Hoffman and Atlas paper: "An important component of the OSSE that improves the interpretation of results is validation against a corresponding OSE. In this regard, the accuracy of analyses and forecasts and the impact of already existing observing systems in simulations is compared with the corresponding accuracies and data impacts in the real world. This ensures that the results of the OSSEs are credible and realistic." A first example of applying this validation step in the ocean is presented in the Halliwell et al. (2014) reference contained in the Hoffman and Atlas paper.

The results contained in the present paper are interesting and should be published. It is too much to expect that the authors develop and validate a comprehensive OSSE system at this time. However, these results should be placed in context with regard to state-of-the-art OSSE systems that enable rigorous validation of results. Such rigorous validation is not possible with the approach used in this paper, which perhaps should be referred to as a "simplified OSSE approach". It therefore should be made clear that these results represent a first look that needs to be validated in the future with a comprehensive OSSE system.

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