

***Interactive comment on “Towards high resolution mapping of 3-D mesoscale dynamics from observations: preliminary comparison of retrieval techniques and models within MESCLA project”***  
***by B. Buongiorno Nardelli et al.***

**B. Buongiorno Nardelli et al.**

bruno.buongiornonardelli@cnr.it

Received and published: 7 June 2012

Both reviewers pointed out that the previous studies on which this work is based are not sufficiently described in the text and that they did not find the present study 'novel' enough or conclusive. We agree that the 'starting point' was not described enough in the text, but we would like to stress that a number of novel results were obtained in this work, especially when compared to similar previous studies. In fact, though each of the individual techniques used was already developed and described in literature, and even if some of the techniques were already combined in previous

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works, it should be considered that:

- 1) none of the techniques considered was ever applied at high resolution (namely resolving mesoscale dynamics) to retrieve data that could be produced routinely within an operational system (namely from NRT, freely available data, and potentially with global coverage); Ruiz et al. (2009) only concentrated on a single eddy observed in a specific area of the Mediterranean sea, using high resolution data from gliders, whose coverage is extremely limited;
- 2) it was the first time that a high resolution SSS product (as this developed within the MESCLA project and described in Buongiorno Nardelli, JTECH, 2012) could be used to retrieve 3d fields. The combination of HR SSS, SST and ADT data is thus absolutely novel;
- 3) similarly, it was absolutely the first time that QG vertical velocities were retrieved from HR observation-based 3D fields that could be produced from data available daily within operational programs (i.e. within Myocean catalogue). The results obtained can thus be considered 'groundbreaking', as they show that a more advanced dynamical framework (compared to simple geostrophic approximation) can be routinely used also when analyzing purely observation-based products.

It is also worth noting that the applicability and tuning of the retrieval methods depends on the area under study, so that the application of the multivariate reconstruction techniques to the Gulf Stream area represents by itself a novel result.

All these aspects would be clarified in a new version of the text, and a revision of the text would clearly keep into account all reviewers' comments.

A detailed answer to the specific points is included as PDF (see supplement at the link below).

Please also note the supplement to this comment:

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<http://www.ocean-sci-discuss.net/9/C480/2012/osd-9-C480-2012-supplement.pdf>

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Interactive comment on *Ocean Sci. Discuss.*, 9, 1045, 2012.

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