

# ***Interactive comment on “Geostrophic Currents in the northern Nordic Seas from a Combination of Multi-Mission Satellite Altimetry and Ocean Modeling” by Felix L. Müller et al.***

## **Anonymous Referee #2**

Received and published: 18 September 2019

The paper describes a new dataset of altimetry and associated geostrophic currents, obtained by merging satellite observations and model simulations, and based on principal component analysis. This approach is a novel way to combine both sources of information and seems to produce consistent results.

I note a certain similarity between this approach and the DINEOF method (see e.g. [http://modb.oce.ulg.ac.be/mediawiki/index.php/DINEOF\\_references](http://modb.oce.ulg.ac.be/mediawiki/index.php/DINEOF_references) ) which fills gaps (clouds) in satellite observations using also a PCA method. However in the current paper, the EOFs are obtained from another source of information (a model) than the observations.

Printer-friendly version

Discussion paper



The authors have carefully addressed the pre-processing required to merge the 2 datasets (offsets etc).

The paper is well written, generally clear and generally does not contain typos. I only have a few general comments or requests for clarifications. In the remainder of the review, by "dataset" I mean the new product that readers can download.

\* page 2 line 7-11. The mentioned regions and main currents should be indicated on a map (e.g. Fig 2 that could then be moved higher in the text).

\* page 9 line 12: write out NN. Only on a later page do we learn it means nearest neighbour (page 10 line 1)

\* page 9 line 25 : it is not clear why the the description of the "individual steps" is provided separately. For example what is written on page 9 line 27-28, has already been mentioned explicitly before (page 8 line 15). Also the corresponding figure (5) is useless as it is just a zoom on a previous figure

\* page 11 line 9-10: "contain" is misleading. Reading this, I could have the impression that the dataset contains the 2 things (satellite & model). By now, the reader has understood that the dataset is build using the 2 sources, but it (i.e. the netcdf file) does not "contain" them. Please rephrase.

\* page 11 line 15: the fact that outliers in the results are rejected, has not been mentioned in the method description. We learn only now about it.

\* figure 6, right column. Wouldn't a quiver plot (arrows) be more explicit than the colors for indicating the direction ?

\* pages 11,13-15 : the authors compare the dataset with different other sources of DOT and currents: "processed" drifter data, original drifter data, ADT. About the second comparison, page 13 lines 16-19, please specify if the rmse computed directly between the drifter and the dataset, is taking as input the original drifter velocity, or is pre-processed (e.g. taking into account only the geostrophic part). Also, line 17, how come

[Printer-friendly version](#)[Discussion paper](#)

the RMSE is suddenly large (0.13 m/s) in this case, especially compared to the velocity itself ?

Finally, apart from the comparisons proposed in the paper, would it make sense to compare the dataset with the DOT obtained directly from FESOM ? In a perfect world, the dataset would even be compared with a data-assimilating version of FESOM, but I understand this is a whole new work and out of the scope of the article.

\* page 17 line 6 : the comparison between "uncompressed" FESOM geostrophic currents and the dataset : what is the meaning of uncompressed ? Also in the article itself, please indicate clearly where you compared the pure FESOM outputs with the dataset, leading up to this phrase in the conclusion.

---

Interactive comment on Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2019-102>, 2019.

Printer-friendly version

Discussion paper

