Responses to reviewers written by P.-Y. Le Traon
pierre.yves.le.traon@ifremer.fr

We thank the two reviewers for their positive comments. Here are our answers to their specific comments and suggestions.

Reviewer RCC627 (P.M. Poulain)

Page 1795. Lines 10-11. I would change this sentence by a sentence like this: Even though the design resolution of Argo corresponding to the 3deg x 3 deg spatial sampling is 200-300 km, that is a scale larger than the mesoscale, simultaneous pairs of floats can have shorter separation distances, allowing to estimate decorrelation for scales as small as tens of km.

answer : we kept the sentence "Although Argo does not resolve mesoscale variability due to its 3x3 spatial sampling, it is very well suited to estimate its main statistical characteristics" but we also added as recommended by the reviewer the following sentences "We focus here on the spatial scales of temperature and salinity variations. Over several years and in given region, there are many nearly simultaneous pairs of floats with different separation distances allowing an estimation of such scales".

Page 1798. Line 7. Explain how did you find 3.337 for the value of a.

answer: a is a constant equal to 3.337 calculated so that $[1 + a + a2/6 - a3/6] = 0$, i.e. when r is equal to 1 Cor (dx,dy)=0. This ensures that Lx and Ly scales correspond to zero crossing correlation scales. This is now added in the text.

Page 1798. Line 9. Change to " .... carried out by using .....".

answer : done.

Page 1798. Line 23. Add "The 2-D temperature weekly temperature fields were sampled at the float positions in 2005 and 2013.

answer : text was modified as follows. "We generated 52 weekly (i.e. 1 year) simulated temperature 2D fields on a 20x20 grid that follows the Arhan and Colin de Verdière (1985) covariance model. The 2D temperature fields were then sampled at the float positions in 2005 and 2013 and an observation noise of 10% was added (E=0.1)."

Page 1799. Line 2. What is L? Is it equal to Lx = Ly, do you assume an isotropic field?

answer: yes. this is added in the text. The calculations were done both for L=100 km and L= 400 km (isotropic field with L=Lx=Ly).

I suggest to give somewhere the values of the scales estimated for all the regions defined in Fig. 3. For instance, add a table with the list of scales values (Lx and Ly) for all the large regions shown in Fig. 3., or post the values of Lx and Ly directly in Fig. 3.

answer: we did not carry out an extensive study of all areas and we have focused on the main representative results (this is a preliminary analysis). Note that for a given areas we get many scales (temperature and salinity scales at many depths).

Reviewer RCC633 (F. D'Ortenzio)

I probably miss something, but could you indicate what are black isolines on figures 4,5 and 6?

answer: explanation was indeed missing. Black isolines correspond to the adjusted covariance model. This is now added in the figure legends.

As referee 1, I suggest to indicate somewhere in the paper the estimated scales values obtained for all the boxes of figure 3. This should be a real improvement of the paper for interested peoples.

answer : see answer to referee 1

Pag 1798. Line 7. As referee 1, how you obtain the value of a (3.337)??

answer : see answer to referee 1

Pag. 1800, line 29, remove double parentheses.

answer : done

pag 1802, line 24 "..precise enough..". not clear, please rephrasing

answer: this is now precised. "error on correlation below 0.1 to 0.2"