



Interactive comment on “Wavelet-based spatial comparison technique for analysing and evaluating two-dimensional geophysical model fields” by S. Saux Picart et al.

Anonymous Referee #1

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Some general and some specific comments

This is a useful adaptation/improvement of a powerful validation technique which should be of use to the scientific community.

However the method completely ignores the question of bias between the datasets being compared. This is billed as a positive aspect of the method because it allows the user to better investigate the spatial structures but this is not explained enough.

I think this should be expanded on a little further - in particular explaining why we should want to ignore the bias to compare spatial patterns.

C1359

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It is also worth mentioning the fact that biases between datasets can be inferred from the results of this method by comparing the relative sizes/values of the quantile ranges for each dataset.

Some other points to consider are:

1. Inclusion of Briggs and Levine (1997) in literature review to show that these wavelet techniques are older than Casati et al. (2004) (most of the cited texts are post 2004).
2. I think that Casati et al. (2004) should really be referenced in the abstract rather than simply saying “A methodology has recently been developed”
3. Do we need quite so many plots in Figs. 4 and 5? I think the point could be made with many fewer images if space was tight.

Mathematical corrections

3167-12: Should be “[$V^{0\%}, V^{20\%}$]” rather than “[$V^{0\%}, V^{20\%}$ [”. If the “[” is meant to signify strictly less than (i.e. not equal to) then the terminology “[$V^{0\%}, V^{20\%}$)” would be preferable.

3167-17: It might be worth explicitly defining quantile ranges [X^{q_1}, X^{q_2}) here and mention that you call these q later?

3168-22: The RHS of equation (4) uses the strange terminology $W_{father}^{l,q}$ and $W_{father}^{l-1,q}$ which are not consistent with the rest of the paper. I would recommend changing this to $W_{father}^l(Z_q)$ and $W_{father}^{l-1}(Z_q)$ to be consistent with the LHS of this equation – and equation (3) above.

3169-1: You could tie this into the definition in 3167-17 above?

3169-11: The sum on the RHS of equation (5) has two upper limits! The “, q ” should

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be removed.

3169-16: I am left unsure what the summation notation is doing in equation (6). In particular what indices/ranges are these quantities being summed over? Is it summation over the whole domain? Or should it be using the $\langle \cdot \rangle_{2^L x 2^L}$ averaging notation? This should be cleared up.

3170-6: Equation (8) is missing an L from the top row (or $1/L$ on bottom as is in Casati et al.). This has already been corrected by the authors in response to a public comment.

Figure corrections

Figure 2b is incorrect and is just 2a replicated. I note that the correct image has been subsequently added by the authors.

Minor corrections (spelling/grammar etc.)

Some spelling and/or grammar corrections generally in the form change “this” to “that” (although some are different). Most of these are related to mix-ups between tense (i.e. past vs. present) or quantity (i.e. singular vs. plural):

3162-26: “through analyzing” should be either “by analyzing” or “through the analysis of”

3163-2: “application” to “applications”

3163-7: “ecosystem” to “ecosystems” (or “the marine ecosystem”)

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3163-12: “a prominent subject of” to either “a prominent subject for” or “the prominent subject of”

3163-14: “works” to “works,”

3163-15: “models” to “models,”

3163-17: “2009),” to “2009)”

3163-28: “the identification of the” to either “identification of” or “evaluation of”

3164-5: “Casati and Stephenson” to “Casati et al.”

3164-10: “Casati and Stephenson” to “Casati et al.”

3164-28: “assessing” to “addressing”

3165-1: “impact on” to “impact upon”

3165-3: “Casati and Stephenson” to “Casati et al.”

3165-17: “methodology” to “methodology of Casati et al. 2004”

3165-17: Mention paper finishes with conclusions in Section 4?

3165-22: “methodology” to “methodology of Casati et al. 2004”

3166-1: “Casati and Stephenson” to “Casati et al.”

3166-17: “It then inspired” too colloquial (i.e. chatty rather than scientific)

3167-2: “the the” to “the”

3167-6: “Casati and Stephenson” to “Casati et al.”

3167-9: “define” to “define quantiles”

3167-17: Sentence needs rewording

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3167-19: either change “chose” to “choose” or “is identical” to “would be identical” to be tense consistent

3168-12: Sentence needs rewording (“using a slightly modified from the original one”). NB. Also calling it “slightly modified” rather plays it down. Perhaps it should be something more exciting like “an improved method”?

3168-12: “Casati and Stephenson” to “Casati et al.”

3168-17: “Casati and Stephenson” to “Casati et al.”

3168-18: “by a spatial averaging” to either “by spatially averaging” or “by performing a spatial averaging”

3169-3: Perhaps mention that missing/occluded data has been accounted for?

3169-3: “, it” to “ and”

3170-11: “North East European shelf sea” should either be “Northwest European Shelf seas” or “North East Atlantic European shelf seas”

3170-13: “a brief introductions” to “a brief introduction” or “brief introductions”

3170-16: “it’s” to “its”

3171-9: remove brackets around “coarser”?

3171 conflict of case between present tense such as “is” (line 7) and “are” (line 8) and past tense such as computed (line 10) and created (line 14). Sometimes contradictions within the same line such as “are created” in line 14.

3172-1: “This last remark” is rather colloquial. Remove “last remark” or reword

3172-4: “North” to “north”

3172-6: “North” to “north”

3172-7: “allows to” to “allows us to”

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3172-8: “time” to “times”

3172-22: Perhaps it’s worth mentioning here that skill scores are generally lower for chlorophyll than for SST?

3172-28: “But on the other hand” is very colloquial. This should be reworded

3173-1: “illustrates” to “illustrate”

3173-1-3: These 3 sentences are a bit disjointed an should be reworded

3173-4: “quantile” to either “quantile ranges” or “quantiles”

3173-9: “different depth” to “different depths”

3173-13: “skill score” to “skill scores”

3173-14: “is to be” to either “appears to be” or just “is”

3173-16: “North-West” to “northwest”

3173-17: “field highest” to “field, the highest”

3173-18: “North-West” to “northwest” (x2)

3173-19: “translate” to “translates”

3173-20: “the same figure” to “Fig. 1”?

3174-10: remove commas from this line

3174-10/11: I am not sure that equilibrated is the word you want here? Perhaps say “and hence guarantees equivalent structural maps”? or are we implying equilibrium somewhere?

3174-14: “Casati and Stephenson” to “Casati et al.”

3174-17: “enable to” to either “enables us” or “enables the user”

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3174-23: “allow” to “allows”

3175-2: what are “spatial datasets”? perhaps just say “two datasets” or “different datasets”?

3175-5: “, (ii)” to “ and (ii)”

3175-7: “selection, and” to “selection as”

3175-24: “model” to either “modelling” or “models”

3175-26: I don’t like “model’s”. Perhaps say “comparing outputs from two different models” instead?

3175-28: “parametrisation” to “parametrisations”

3177-1: citation should be “Casati, B., Ross, G. and Stephenson, D.”

3177-18: “modi?cations” should be “modifications”

3183: “histogram” to “histograms”

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