# *Interactive comment on* "Multiresolution analysis (MRA) classification of plurennial to multi-decadal climate drivers to streamflow in France using Wavelet Transform and Geostatistical Euclidean Distance Clustering" *by* Manuel Fossa et al.

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Reply to AR#1 published 18 january 2017

We thank AR#2 for his review and questions.

Reply to Overall Review and Recommendation

We agree with the point about references as we did with AR#1 and will cure this in our corrected article.

We agree about the lack in comparison with other studies. However we want to stress

that since the study is multiresolution (that is each time scale is treated differently) it quite reduces the literature available for comparison. As for the first point, we will improve this part following AR#1 and AR#2 remarks.

We also agree on more description about the methods and will follow suggestion made by AR#2.

Reference problems are software related and a typo, this will be corrected.

Reply on specific points:

1)Regarding the part of the decomposition of the time series in different TSVs, I'm wondering if it must be used a significance testing in order to take into account the 95% confidence for a red noise process (Torrence & Compo 1998 "A practical guide to wavelet analysis"

There's no signficance test for Discrete Wavelet Transform (which is the Wavelet transform used for multiresolution analysis) so far. However, we know that the those scales and significant because other works from our team with CWT on discharge, rainfall has shown that they are significant. We also want to stress that not significant doesn't mean noise. It barely means the test can't distinguish between noise and relevant signal. When wavelet transform coefficient are smooth over an interval and that at least one part of that smooth interval is significant, it is unlikely the rest of interval is not. This is relevant not only to temporal analysis but spatial analysis as well.

2/In the case it is appropriate to calculate the significance testing of the time series, I'm not sure that it makes sense to calculate the correlation over the entire time series, but only in the part that passes the signifi- cance test.

See previous answer.

3/In the case it is appropriate to calculate the significance testing of the time series, I'm not sure with timeseries ranging from 1968 to 2008 if it is possible to effectively evaluate the TSVs 21 years.

This question is related to the size of the wavelet at 21 years versus the length of the time series. We agree the 21 years results should be taken with caution. However please note that "21 years" (as for other time scale) is not the variability present only at that scale but around that scale which means that it brings variance from lower scales. Additionnaly comparison with with other TSV allows to have some clue about the physical reality of the clusters (there's little probability that a spatial structure emerges by chance).

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