

Nonlin. Processes Geophys. Discuss., referee comment RC2
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Comment on npg-2021-37

Anonymous Referee #2

Referee comment on "Empirical adaptive wavelet decomposition (EAWD): an adaptive decomposition for the variability analysis of observation time series in atmospheric science" by Olivier Delage et al., Nonlin. Processes Geophys. Discuss.,
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The manuscript by *Delage et al.* presents a new method for adaptive filtering with the aim of combining the advantages of empirical mode decomposition (EMD) and empirical wavelet transform (EWT). The concept of combining EMD and EWT to overcome issues inherent with both decomposition techniques is interesting and somewhat novel. The new method could represent another useful tool for analysing non-linear time series. However, in its current form there are several major issues with the manuscript.

First and foremost, representation of the benefits of the method could be far more substantial. The manuscript relies on a single example and would strongly benefit from more than one example of its application. It would also be interesting if the results of the EMD compared to the new EAWD method were explored more in depth. I feel the manuscript would benefit if there were much more substantial discussion of the results obtained by EAWD compared to EMD in these different examples. I would at least expect to see enhanced discussion of how and why the results are different in different examples, as well as some contemplation on which situations the new method is likely to be most beneficial. Currently, I do not believe the argument for using the new method is especially compelling.

Furthermore, the manuscript is currently very difficult to read. Regular grammatical and spelling errors are apparent throughout the manuscript. As it is, it is difficult to follow how exactly to interpret the method. I would strongly recommend that the manuscript would benefit from proof reading and rewriting to greatly improve readability.

In addition, it would be extremely beneficial to provide a sample script and sample data as a supplement to the manuscript. In its current form it would vastly reduce the potential outreach of the paper to not provide this.

The manuscript will require substantial and significant revisions to be acceptable for publication, although I do believe the core idea behind the manuscript is of sufficient interest to the readership of nonlinear processes in geophysics.

Specific points:

Abbreviations – The paper manuscript would benefit from an abbreviation list at the beginning. Consistency in abbreviations is also needed throughout, IMF for example doesn't get defined until its 4th use

Abstract – This could be improved a lot, currently the new method is not even mentioned till the 4th line from the end. The abstract should be written to better describe why there is a need for this new method, what the new method is, and how it is shown to be useful in this manuscript.

Introduction – The introduction is currently one block paragraph and would benefit from being broken up.

Section 2.1 – This is often repetitive of things already stated in the introduction

Section 2 – I think some discussion of requirements for the data if they're to be used in this method would be helpful.

Equations – these should be consistently listed throughout, it is confusing that they are often in text.

Figure 1-3 – French used instead of English numerous times

Figure 4-5 – Y-axis should be labelled Ozone, and Dobson made clear as the unit

Figure 5 – Time unit needs labelling, and y-axis should be made bigger