Reply to "Interactive comment on "Technical Note: Multiple wavelet coherence for untangling scale-specific and localized multivariate relationships in geosciences" by W. Hu and B. C. Si " by Referee #1

The manuscript of Multiple wavelet coherence by Hu and Si presented an important topic. In characterizing scale specific variations, wavelet coherence has been used in many field but was restricted to only two variables. Presentation of wavelet coherence produces a step forward on the methodological development aspect. The method will support a lot of different fields including soil science and hydrology. The scientific content is suitable for the journal and the readers of this journal will be interested in this topic. Therefore, my suggestion is for acceptance of the manuscript with some minor corrections such as English, which could be improved. Another thing, authors used the artificial series to compare with other multi-variate analysis. Just wondering, how will you confirm about you claimed superior information of the new method compare to other methods. I mean to say, how will you say that this variations, what is shown by other methods are also showing the right information. The variations showing here could be spurious as identified by different methods.

Response:

Thank you for the positive comments.

In terms of language, we have tried our best to correct it. We will ask an English editing company check the language again if we will be given a chance for revision.

We are not very sure we understand your second comment, but we will try to explain a bit here. The two existing methods (i.e., multiple spectral coherence and multivariate empirical mode decomposition) are widely used for spatial or temporal series analysis in different disciplines. Actually we have known that these two methods cannot deal with localized relationships between variables. Therefore, the advantages of the new method over these two methods is demonstrated mainly in terms of relationships between response and predictor variables at various scales of the response variable. The reason for using the artificial data is that the major features (e.g., scale) are known. Then, the superiority of the new method over these two methods can be assessed by whether the known major features of the artificial data are demonstrated by these methods. Our results clearly show that localized multivariate relationships are not available by the two existing methods and both methods are likely to underestimate the degree of multivariate relationships for non-stationary processes. Because the cosine-like artificial datasets mimic many time series and spatial series in geosciences. Therefore, we conclude that the new method is superior.

All above mentioned information will be incorporated in the revised copy.