

Dear referee,

Thank you for reviewing our manuscript. We appreciate all your invaluable suggestions and comments. We have modified the manuscript accordingly, and detailed corrections and explanations are listed below point by point. We believe that by presenting and publishing the interim results other scientist can apply the findings and discussions can be started to further develop the new methods.

Referee 2#' comments: This paper is analyzing the multi-scale periodic features involved in the annual and seasonal precipitation signals. Reading thoroughly the paper it is my opinion that it is very interesting but a bit out of topic for NHESS. Especially because it is showing a very detailed mathematical analysis of the problems without allowing to external readers to properly understand what can be the advantage of the proposed methodology, both in other hydrometeorological studies and also in other geophysical fields. Only readers that already knows previous studies and the applications of the method in very detail can take advantage of the paper.

Similarly, also in the conclusions, there is the same problem. What is really lacking is to highlight what is the advantage of this research for a more general scientific public that dealing with hydrometeorological hazard. In conclusion the paper is interesting but in my opinion can be, for instance, more suitable for Nonlinear Processes in Geophysics.

✓ **Since the CWT, XWT and HHT algorithms have already been popularly used in the hydro-meteorological signal, environmental signal, electromagnetics signal, and mechanical signal 's time-frequency characteristics research in recent years, we believe that the mathematical analysis in this paper can be understood by many types of readers. The new ideas of combining CWT and HHT methods to improve the hydro-meteorological signal's multi-scale time-frequency characteristics revealing capability, and of introducing the XWT method into the earth system science in this paper will provide some new research directions for studying the multi-scale time-frequency characteristics and the interactions of different environmental signals in the earth system.**

Other revisions:

- ✓ **We have carefully checked the English presentation and grammar and tried to avoid any formal mistakes. Some awkwardly stated sentences and compound sentences have been rewritten. The personal pronouns, "we" and "our", and the contractions, "can't", "don't" and "couldn't", have been revised. The correlation coefficient R has been replaced with r. Several colleagues who are skilled authors of English language papers have been invited to check the English in this paper. We believe that the language is now acceptable for the publication needs.**
- ✓ **We have reproduced all the figures to the highest possible standards.**
- ✓ **We have carefully checked the references both in the list and manuscript text. Some little errors have been revised, such as the missed or wrong volumes, wrong page numbers.**
- ✓ **In the 'Acknowledgements' section, the grants have been shorten.**
- ✓ **In addition, according to the authors' negotiation and agreement, the corresponding author has been changed from the first author to the second author.**