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Hydrology and Earth System Sciences Discussions

Interactive comment on "Analyses of relationship between Loess Plateau erosion and sunspots based on wavelet transform" *by* P. Gao et al.

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First of all, thank you for attention to our work and made very constructive comments and suggestions. For you point out general comments: 1) Indeed, as you said, wavelets are not a panacea. However, the wavelets can demonstrate the phenomenon of the problem, as mentioned in this paper. The purpose of this study is to show that the phenomenon–sunspots and the soil erosion in the Loess Plateau may have some relationships. Wavelet is a tool and method used. 2) I did not think the CWT is most suitable for this study. But I made reference to the literature (Wang, 2005), that it may apply to this study. CWT also has a discrete form. It is the application of the discrete form in this paper (Equation show in supplement pdf file). 3) Thank you for your advice. For the method of choice, I am more concerned about the final

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results. However, I will focus on other methods. For you point out specific comments: 1) Thank you for your advice. After all, English is not my mother tongue. But I will try my best to modify the paper. 2) Yes, I made a mistake. I will modify it in the next version. 3) Yes. The expression “wavelet variance” (Equation 3) is generally reserved to variances calculated from DWT. It is uses the discrete form of CWT in this paper, and have been explained in general 2. I will add explanation in the next version. 4) “Scale” selection is based on the length of time series data. I am not sure I fully understand your question. 5) This is a problem of the data extension at both ends. Before using wavelet analysis, I use the data extending method in Matlab software, so, the original data were processed to eliminate its impact on the results. Thank you very much again. References: Wang W. S., Ding J., Li Y. Q.: Hydrology wavelet analysis. Chemical Industry Press, Beijing, China, 207pp., 2005.

Please also note the supplement to this comment:
http://www.hydrol-earth-syst-sci-discuss.net/8/C256/2011/hessd-8-C256-2011-supplement.pdf

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