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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Teleconnection analysis of runoff and soil moisture over the Pearl River basin in South China" *by* J. Niu et al.

Anonymous Referee #2

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The manuscript tried to establish the teleconnection between ENSO and IOD for the Pearl River basic. The authors utilized modeled runoff and soil moisture (with VIC model) and a variety of statistical methods. They found that the dominant variability of the time series of the runoff and soil moisture is correlated with IOD. I have the following general comments: (1). VIC model has no consideration of connectivity, which is important for runoff generation (quantity and timing). Discussion on how this might affect your interpretation and validity of this research should be discussed. (2). There are lots of places that put too much emphasis on statistical significance, but do not mention the physical (hydrological) meaning. For example, three modes were separated out though Principle Component analysis, but the physical meanings of these three modes are not discussed. In addition, a correlation coefficient of 0.3, albeit statistical significant, can

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only explain less than 10% of the variance of the dependent variable, which do not have much meaning of predicting the dependent variable from the independent. Therefore, I would not say too much if the correlation coefficient is less than 0.4 (depends on the authors). (3). Interpretation of the wavelet spectra needs improvements. I think wavelet coherency figures should be divided into global and local. IN most cases, we are interested in global features, rather than the local features. If your purpose is to establish teleconnection, you need to look at global wavelet coherency, not the local coherency. In your analysis (Figs. 8 and 9), there are only local features. Local coherency could be coincidence. In my opinion, only when there five or more statistical significant local features at the same scale can be considered as global. (4). Correlation coefficients and coherency should be large to be considered as useful for data interpretation. In your wavelet coherency figures, there are no legends on wavelet coherency grey scales. Please add them, because we are not only interested in statistical interpretation, but also values of the coherency and Spearman rank correlation coefficients. (5). I am not sure if "inferences on drought and floods" section is needed. Little new information is added to the paper by the two sections. (6). You need to add more details on the PCA. Explain how you did it, and what the physical meaning of the three modes is.

Minor comments: (1).Line 12, Page 11955, please add description and provide basic statistical parameters of your raw data of precipitation, runoff and soil water contents, so the readers could. Otherwise, I cannot judge much variance in the raw data can be explained by the independent variables. (2). Line 15, Page 1195.you can count the number of large spikes from Figure 2 and 3 to verify the scales or frequency of runoff and soil water. (3). Line 1,Page 11957, how did you select BLVB? What is the criterion? (4). Line 5, Page 11957. Can you also test the statistical significance of the "Striking Features"? (5). Line 10, Page 11961. Pay attention to the values of your correlation coefficients. Some of them are too small to be meaningful.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 11943, 2013.