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Hydrology and Earth System Sciences Discussions

Interactive comment on "Long-term meteorological and hydrological dryness and wetness conditions in the Zhujiang River Basin, South China" *by* T. Fischer et al.

Anonymous Referee #2

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The authors present a paper on the application of the Standardized Precipitation Index (SPI) and the Standardized Discharge Index (SDI) to identify dry and wet periods in the Xijiang River basin, a sub-basin of the Zhujiang (Pearl) River. A principal component analysis was applied to the SPI-24 series. Moreover, the SPI-24 and SDI-24 series were analyzed by means of Fourier and wavelet transform. Significant periodicities detected in the SPI and SDI series were then extrapolated to the year 2030. Overall, the manuscript contains a lot of valuable information. However, it needs to be revised based on the comments listed below.

Due to the applied nature of the research undertaken, it seems appropriate to name the method and to refer to other publications offering an in-depth description of the method. Nevertheless, more detail is needed in some places:

- Chapter 2.3.1: For SPI and SDI: The authors should explain the fitting procedure.

- Chapter 2.3.2: Description of procedure and outcome do not match. The authors describe that they used "the PCA to sum up the spatial patterns of co-variability of dryness and wetness according to the SPI-24 series at different stations". Accordingly, I expect the loading patterns of the principal components (Fig. 8) to show spatial variations in each of the sub-basins.

- Chapter 2.3.3: The authors need to explain how significance testing was carried out in the case of the Fourier and the wavelet transforms. Was white noise assumed? If so, why?

- Chapter 2.3.4: The authors need to explain why they expect periodicities to be stable in time.

The title of the manuscript requires revision. According to the time period under observation, "meteorological" is not the correct term to use. "Climatological" should be used instead. Also the phrase "dryness and wetness conditions" (like "meteorological" used throughout the manuscript) should be avoided. I would make use of the expressions "dry periods" and "wet periods".

The language needs to be improved throughout the manuscript.

page 10531, row 9-11: I recommend that the authors provide a table. Also, instead of "drought" the term "dry" (=extremely dry, severely dry, moderately dry) is the better choice.

Page 10535, row 16: $1<SPI\leq1.5$ for moderately wet

Page 10535, row 17: $-1.5<SPI\leq-1$ for moderately dry

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Interactive Comment

Fig. 9 and 10: x-axis: less minor tick marks would improve legibility; dashed line needs to be explained

Page 10535, row 17: "[. . .] and that the cycles in the SPI-24 dominate cycles in the SDI-24." The authors need to explain how they come to this conclusion based on Fig. 9.

Fig. 11: legend needed

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