Hydrology and
Earth System
Sciences

Discussions

Interactive comment on "Investigation of hydrological time series using copulas for detecting catchment characteristics and anthropogenic impacts" *by* T. Sugimoto et al.

T. Sugimoto et al.

takayuki.sugimoto@iws.uni-stuttgart.de

8) Section 4.1.In general this section is very interesting. I would suggest to better explain if the distance D is based on empirical copula and why this is important; and the uncertainty of the estimated distance. Maybe these notions are already included in the text but it should be better clarified.

>Why it is important that empirical copula should be used for distance D . . ..

This study started with the analyzing the asymmetry of empirical copula and distance D is an extension to it. It is not necessarily to be empirical copula, but seems natural

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to use it for the purpose of this study.

>; and the uncertainty of the estimated distance

1. From the definition, copula variance can be related to the model uncertainty; how much the natural system is varying. This can be related to the potential calibration difficulty of hydrological model or any parameter estimation in global climate model.

2. Estimation uncertainty of copula distances might be interesting, but seem complicated. It is possible to calculate copula distances for 77 discharge data from different gauging stations, but these data from same river or same regions should be interrelated and not independent. Thus, it seems not appropriate to talk about estimation uncertainty and not really discussed in this study. Copula distances are just calculated for the stationary Gaussian cases just for the comparison.

These arguments are not clear in my manuscript and I would take care so that they are reflected in it.