Review of the revised paper

Stochastic bias correction of dynamically downscaled precipitation fields for Germany through copula-based integration of gridded observation data.

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The revised version of the paper is much better than the original submission. Unfortunately the authors did not respond to my most serious concern - the problem of the signal. After reading their response given on HESSD I was very puzzled. In my opinion the response cannot be correct. I followed carefully the algorithm given in the paper and obtained the same results as before. Here is my argumentation:

If two variables, the precipitation simulated for a location by the RCM and the observed precipitation at the same location are independent, then for the correction it does not matter what the simulated precipitation is. The correction is simply done by the marginal distribution of the observed precipitation. Thus if for a given time in the future (For example summer 2015) one wants to apply the methodology to correct for the bias of the RCM, then the corrected precipitation can be any value of the observed distribution. It does not matter whether there is an increase of precipitation indicated by the RCM or not. Even if the precipitation is doubled for summer in the RCM runs, after the correction there is no change at all due to the independence. A change could only occur if the marginal distribution of the observed precipitation is also changed. This however is not forseen, and we do not know how the future marginal distribution will look like. The variance for the simulated results will be the variance of the observed marginals - the same for each day.

Note that if the variance is not calculated for the realizations corresponding to a single day, but calculated as the variance of precipitations over a time period such as a season, then it will become zero. The downscaled mean is in this case for every day the same namely the climatological mean of the season.

On the other hand if the rank correlation equals one then there is a one to one relationship between the RCM simulated and the observed precipitation. Thus for any given day there is only a single corrected precipitation value available - meaning that there is no variance. The signal will be preserved as the modified distribution reflects the changes of the RCM distribution. Thus the result is signal preserved and zero variance. In this case if the variance is calculated from the mean values over a season then the variance will be non-zero.

The methodology thus provides a mixture of the RCM changes and the long term climatology. The missing signal could be revived by changing the marginal of the observed precipitation, for example by using a Q/Q transformation of the marginals.

In conclusion I would prefer to have this point cleared before publication. If the authors require I can discuss the problem with them directly.

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