

Interactive comment on “Simulating climate warming scenarios with intentionally biased bootstrapping and its implications for precipitation” by Taesam Lee

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In this paper, the author presents a statistical non parametric resampling approach called intentionally biased bootstrapping (IBB) to simultaneously simulate temperature and precipitation at a single site taking into account the increase of the temperature according to observed global warming data. The manuscript is well organized and the methodology is adequate, reasonable and clearly presented. The problematic and the application are of great interest for GMD. Hence I suggest to publish this paper. However, there are a few statements that don't entirely ring true, and I'd like the author to address these a bit more carefully. Also, drawbacks of the proposed method should be mentioned and discussed.

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Below I list relatively minor points that could be addressed with some small revisions to the text and a few more figures:

1- Line 31: “The temperature variable is the most reliable of the GCM outputs”. I’m not sure that this statement is true.

2- Line 57: I agree that moisture availability increases at the same rate with warming through the Clausius-Clapeyron (C-C) relation. Nevertheless this does not guarantee that precipitation intensity should also increase at the same rate, this presumably assumes stationarity of precipitation efficiency.

3- The proposed approach is based on the assumption that only the mean of observed temperature changes in the future, and assumes a static variance in the future. This assumption should be mentioned. Indeed the proper reproduction of the temporal variability is a very important issue, because a poor representation of the temporal variability could lead to a poor representation of extreme events.

4- Line 166: “Unlike for the case of temperature, there is no variance reduction in the resampled precipitation data because the precipitation data are not conditionally resampled”; I’m not sure that this statement is true. The existence of dependence between precipitation and temperature which motivates this work implies the existence of a concordance in the ranks of these variables. In the case of dependence there will always be some reduction in the variability of precipitation using the IBB technique. I ask the author to verify this fact by comparing the observed variance and the simulated one in the case of precipitation.

5- The proposed approach is not appropriate to simulate change in extreme events, indeed as it is the case for most resampling approach the IBB technique suffers from the inability to simulate values that are more extreme than those observed.

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