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Shortcomings in the tree-ring regional curve standardization and an improvement of the method

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In connection with the problem of the millennial paleoclimatic reconstruction many efforts have been undertaken to improve techniques of different proxy paleodata analysis. Because tree-rings are one of the most often used proxies in the reconstructions many efforts have been done to improve techniques to extract the super low-frequency (of the many centennial and millennial time scales) from tree-rings, and so careful consideration has been done of the technique of the so-called regional curve tree-ring standardization (RCS). But, many unsolved questions remain to be unanswered. The aim of this report is to present some results of the RCS technique application to a tree-ring data set from the Dulan region of the People Republic of China. First of all, we indicate some short-comings in the usually used RCS technique. Then, at the first time we demonstrate the temporal correlation matrices of the tree-ring data processed by the traditional RCS technique. These matrices clearly demonstrate the existence of systematic biases in the tree-ring data processed by the traditional RCS technique. These biases essentially distort the super low-frequency paleoclimatic variations in the millennial reconstruction created on the base of the RCS-processed tree-ring data. We propose an improvement of the RCS technique to exclude such biases from the millennial reconstructions.