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Bias-correction for precipitation over the Alps during present-day control simulations

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During the Last Glacial Maximum (LGM, $\sim$ 21.000 years before present), most of the Alps were covered with ice. A major obstacle in modelling ice flow resides in the large uncertainties of the climate forcing. Precipitation and atmospheric temperature, which are required for the surface mass balance parameterisation, are affected by such uncertainties. To provide some insight on the role of the uncertainties over the Alps, we analyse the bias of precipitation during the present day using observational data from the Swiss Federal Office of Meteorology and WRF simulations forced by Community System Models (CCSM4 and CESM1) and ERA-Interim. The Alps was shaped differently during the LGM, as the ice covered different areas and the topography itself was different compared to the present-day one. In order to be able to account for this difference in shape, it is necessary to construct a new bias correction that depends on the altitude. This bias correction can then be applied to the LGM-simulations. Preliminary results show a larger bias over the Alps (ca. 300%) than in the valleys (ca. 50%), when comparing e.g. dynamically downscaled ERA-Interim data with Swiss surface observations. The strong bias over the Alps and over Switzerland in general can be mostly corrected up to a bias of 3% - 6% using a bias-correction from linear-regression methods.