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Temperatures for the last millennium simulated by different AOGCMs

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Assessing the recent observed warming trends and estimating the future impact of anthropogenic greenhouse gas emissions have led to the necessity to understand climate changes of the past and their connections to natural forcing functions. One possibility to investigate past changes is the statistical reconstruction of climate variability using proxy data, such as tree-rings, ice cores, borehole temperatures or documentray data. This research effort already results in various temperature reconstructions on hemispheric scales, but also in climate field reconstructions for specific regions where enough proxy data was available. Another way to deepen the understanding of natural and anthropogenic climate variability and change is to use numerical simulations with climate models.

In the study we present results from different state-of-the-art atmosphere-ocean general circulation models, applying natural and anthropogenic forcing estimates to simulate the last millennium. A first attempt is to determine the surface temperature range in which different model simulations with different forcings vary on the hemispheric scale. Moreover, insights on zonal surface temperature changes in time will be presented and their relationships to different forcing functions will be analyzed.