[redacted] VARIABILITY AND GREENHOUSE WARMING

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Simulations with coupled atmosphere-ocean models have shown a significant impact of the anthropogenic increase of greenhouse gases expected by the middle of the 21-st century both on the global climate and the regional climate particularly over the monsoon regions of Asia and Africa. However, due to the computation cost, these simulations have been carried out mostly with coarse resolution GCMs, which do not allow to represent in detail the geographic variations of the land surface processes and their possible feedbacks.
In order to achieve a higher spatial resolution over Africa time-slice simulations have been carried out with the variable resolution version of the Arpege-Climat model, with a zooming technique based on a conformal deformation of the spectral sphere (Courtier and Geleyn, 1988), thus allowing to reach a resolution of about 100 km over Africa. A control simulation has been carried out for the current climate to serve as a reference and validate the model. A transient atmosphere-ocean simulation in a greenhouse gas increase scenario for the next century has been used to provide the sea-surface temperatures (SST) for a period in the middle of the 21-rst century. The simulated SSTs are imposed as boundary conditions for the high resolution stand-alone GCM simulations in time-slice mode for a period of 30 years. The impact of the greenhouse warming on the African monsoon simulated by the high resolution GCM will be illustrated and discussed in this presentation.