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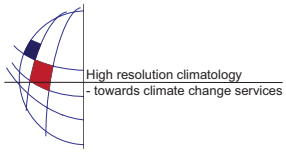

Simulated and Reconstructed Climate Variability in China during the last 1200 years

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The climate variability in China during 800-2005AD is assessed by a comparison of a millennium simulation and reconstructions for near surface temperature and precipitation. The model data is given as 5-ensemble simulations by the atmosphere-ocean general circulation model ECHAM5/MPI-OM subject to anthropogenic and natural forcings. The uncertainty of the simulations is assessed by the ensemble spread which varies on long time scales and shows relationships to decadal variability. The simulation reveals weak long term anomaly periods known as the Medieval Warm Period (MWP), the Little Ice Age (LIA) and the Modern Warming (MW). Transient temperature anomalies in the Northeast, Southeast, and West China are detected up to centennial time scales. The amplitude of the annual cycle since 1800AD is distinctly lower than during the MWP. For the state-of-the-art solar irradiation reconstruction the simulation underestimates the reconstructed temperature variability. Temperature variability shows a continuous power-spectrum with weak long term memory including an ENSO (El Nino/Southern Oscillation) signature and without further periodicities found in reconstructions. Precipitation decreases in the simulation after 1800 which is partly attributed to land use change. The volcanic eruptions in 1258 (unknown) and in 1815 (Tambora) led to changes in temperature and precipitation which differ within the ensemble members. Drought conditions which caused past famines in South China (Yunnan province) are determined by the standardized precipitation index (SPI).