



Estimates of hydrological cycle characteristics from results of paleoclimate simulations during warm periods

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Characteristics of the atmospheric hydrological cycle have been analyzed using results of paleoclimate simulations with the coupled atmosphere-ocean general circulation model KCM (Kiel Climate Model). The simulations are forced by changing orbital parameters (corresponding to the Eemian and Holocene periods) and atmospheric greenhouse gases concentration (modern to future). The residence time of atmospheric moisture (or cycling time of moisture) as simulated by KCM model for the present climate is in a good agreement with observations. Model results show steady increasing moisture cycling time with global temperature. This effect will be due to exponential increasing (with temperature) water holding capacity of the atmosphere. The response of atmospheric moisture transport and precipitation recycling (contribution of local evaporation to the precipitation) over continents to the orbital and CO₂ forcing is also analyzed.