



Assessing the atmospheric water cycle contribution to uncertainties in CMIP3 models

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The performance of climate model simulations has traditionally being assessed by model output comparisons with observational data. The choice and combination of variables and the choice of statistical methods are thereby subjects of intense research. Problems however, arise from among others, the quality of observations, the length of the time series, and the fact that uncertainties can only be identified from past time periods, which may not be representative when climate changes in predictions of the future. In this study an alternative approach is suggested that is purely based on thermodynamic principles and independent of observational data comparisons. The climate component used to develop the metric is the global atmospheric water cycle. The thermodynamic principles of the water cycle are the Achilles heel in the climate system and hence ideal for such an approach. Tests of CMIP3 coupled ocean-atmosphere models, extensively used in IPCC-AR4 (2007), will be discussed and the performance ranks of runs of the 20th and 21st century will be shown.