ATS/CIRA Colloquium

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Visiting CSU ATS from Massachusetts Institute of Technology

Response of precipitation to climate change: theory, simulations, and observations

Hosted by Thomas Birner

Thursday, October 6, 2011

ATS room 101; Discussion will begin at 3:30pm
Refreshments will be served at 3:00pm in the coffee lounge

Climate change is expected to strongly perturb the atmospheric hydrological cycle, with potentially large changes in the distribution of precipitation. In this talk, I will focus on the factors controlling changes in mean precipitation and changes in intense precipitation events (referred to as precipitation extremes). Changes in mean precipitation will be discussed within the framework of the global or local energy budget. Issues to be addressed include the extent to which the energetic constraint on precipitation changes may be viewed as a radiative constraint, and the causes of intermodal scatter in the changes in atmospheric radiative cooling. In addition to changes in mean temperature, factors governing changes in precipitation extremes include changes in circulation strength and the temperature anomaly when extremes occur. Tropical precipitation extremes are not reliably simulated in global climate models, and I will discuss some efforts to understand and constrain their response to climate change using idealized cloud system resolving simulations and observed variability.