



New observations of clouds and precipitation from CloudSat

G. Stephens

Atmospheric Science, Colorado State University, USA, stephens@atmos.colostate.edu

This talk will present early results from the CloudSat mission and provide an indication of other precipitation-related research that is ongoing under this mission. Analysis of CloudSat observations that reveal the joint properties of clouds and precipitation will be underscored and preliminary results of precipitation retrievals (both solid and liquid) will be presented. The early results from analysis of CloudSat data that will be highlighted has so far focused on tropical cloudiness. It will be shown how these analyses reveal a number of remarkable features about the planets hydrological cycle. For example precipitating clouds in the tropics primarily occur in three modes, a highly frequent shallow mode of precipitation, a deep mode of precipitation with a third congestus mode of cloudiness and precipitation occurring in regions of deep convection. Analysis shows dramatic regional differences in cloudiness and precipitation structures and reveals how precipitating clouds are markedly deeper than non-precipitating clouds. Over the global tropics, 16 % of the clouds detected by CloudSat produce detectible precipitation although this fraction varies significantly from region to region for reasons not yet understood. Time permitting, analysis of cloud-precipitation structures in the extra-tropics will also be presented.