IRS2012-525
International Radiation Symposium 2012
Dahlem Cube, Berlin, Germany, 06 – 10 August 2012

Validation of cloud physical properties associated with tropical cyclone from Cloud Resolving Storm Simulator using A-Train satellite constellation

C.-T. Chen and T.-P. Tzeng

National Taiwan Normal University, Department of Earth Sciences and Institute of Marine Science and Technology, Taipei, Taiwan (chen@rain.geos.ntnu.edu.tw, 886-2-29333315)

Due to their hugh potential damage to the economy, society and environment, the impact of climate change on the frequency and intensity of tropical cyclones are investigated with increasing high-resolution climate models with more detailed cloud microphysical schemes applied. Although some of the model can reasonably capture the frequency distribution of basin-scale tropical cyclone tracks, the intensity and associate precipitation are often underestimated. Further, the detailed cloud morphology and microphysical fields in the models are not well validated and constrain. These problems could lead to questions to the reliability of future changes projected by these models.

More recently, high resolution satellite estimate of cloud and other meteorological fields are available. Cloud radar and lidar are linked with other passive remote sensing of temperature, moisture, and precipitations. Also the satellite data simulator packages are offerred to the modeling community to facilitate more direct comparisons. Using a cloud resolving storm simulator running at 3-kim resolution and explicit convection, we study the model's capability in reproducing a sample of observed tropical cyclones with different intensities. Using the data from A-Train satellite constellation and satellite data simulator, cloud morphology and microphysical fields and their associations with dynamical processed in the model are evaluated. The biases produced by model provided additional clues for the refinements of cloud parameterizations.