Geophysical Research Abstracts
Vol. 15, EGU2013-6605, 2013
EGU General Assembly 2013

Global inspection of cloud feedbacks to radiative forcings from a satellite perspective

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The knowledge of the response of clouds to a warming or cooling of the climate still needs to be properly quantified and in particular the inter-relationship between top-of-atmosphere radiation and surface temperature with cloud properties should be more clearly defined. This relationship will be investigated globally in order to determine their spatial distribution. A detailed inspection of this distribution may help to determine a link between the radiative forcing and its effect on clouds either causing a shortwave cooling or longwave warming globally and within a particular region. Such an exercise could provide a measure for the cloud feedback, one of the largest sources of uncertainty in climate change research. In addition, monthly cloud properties from MODIS (Moderate Resolution Imaging Spectroradiometer) as well as shortwave and longwave top-of-the-atmosphere radiative fluxes from CERES (Cloud and Earth's Radiant Energy System) onboard Terra and Aqua will be used to investigate if there exists any links between these parameters. Time series of cloud properties will be constructed to visualize their variability over time to allow speculation for their change. Correlation of top-of-atmosphere longwave radiation and surface skin temperature with cloud properties from the AIRS (Atmospheric Infrared Sounder) instrument onboard Aqua will be calculated to determine their relationship and how much of an influence these parameters may have on these cloud variables spatially and its role in cloud feedback. These results will be later compared to those from other related studies to provide a better understanding of how clouds respond to a change in the climate.