

A new approach to estimate model generated hydrometeors over East Asia

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In 2013 and 2014, the precipitation over North East Asia shows anomalous trend. Precipitation over the North East Asia during 2013 summer was significantly higher than the climatological mean of that region; whereas during 2014 it was found to be significantly lower. To study the aforesaid anomalous trends during consecutive years, we used the Global/Regional Integrated Model System (GRIMs). The model was run at a horizontal resolution of approximately 25 km (Gaussian grid T510). It was found that the model overestimates the amount of hydrometeors compared to amount estimated by the Tropical Rainfall Measuring Mission (TRMM) Microwave Imager (TMI 2A12).

We adopted a new approach, the average ratio (R) between cloud scale (the area covered by convective cloud over a grid), and the grid scale is calculated from the satellite data. Then the amounts of hydrometeors derived from convective parameterization scheme (CPS) are scaled by the aforesaid ratio (R). The scaled values are added to the amounts of hydrometeors derived from the microphysics scheme (MPS) to compute the total model generated hydrometeors. This approach shows significant improvement in the path values of model generated hydrometeors in comparison with TRMM 2A12 over East Asia for 2013 and 2014. We modified the radiation process inside the model using the new estimates of CPS hydrometeors (scaled by factor R). Our talk will cover this approach in details.