



The influence of wind and land evapotranspiration on monsoon precipitation intensity and timing

Astrid Fremme and Harald Sodemann

Geophysical Institute, University of Bergen and Bjerknes Centre for Climate Change (astrid.fremme@uib.no)

Variations in precipitation in South East China, where rainfall is dominated by the East Asian Monsoon, is closely connected with agriculture and economy in the region. While the East Asian monsoon sets the foundations for the yearly wet and a dry seasons, there are many mechanisms contributing to intra-seasonal and interannual precipitation variability. Through studying changes in moisture sources, we look into the effect of moisture storage on land in the form of soil moisture and vegetation on precipitation variability. We use the Lagrangian model FLEXPART and a diagnostic tool with wind and humidity from the ERA Interim reanalysis as input to diagnose the moisture transport to the Yangtze River Plain. Moisture transport is quantified for each rain event in the period 1979-2013. Calculating moisture budgets along the air parcel trajectories on a 6h time scale we obtain a quantitative estimate for contribution of surface evaporation to the target region precipitation. For the climatology our results show a different timing for peaks in precipitation, local evaporation and local recycling, with around one month between each. Changes in the large scale circulation seem to be more important than changes in local moisture storage for creating the lag in peaks, with weaker winds bringing less moisture from distant sources into the region, as well as bringing less local moisture out of the region. Through looking at separate years we also examine the connection between changing moisture sources and precipitation in extreme years.