

Asymmetry of global water vapor

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Heat and moisture exchange over land is different from over ocean, including its heat capacity and moisture supply and storage. Heat capacity over land is smaller than over ocean so the energy balance over land is quicker. Unlike ocean that has infinite water, land hydrology becomes critical in determining water supply to the atmosphere because of limited soil water. To understand the land hydrological process over Taiwan, data sets from Water Resource Agency (WRA) and Central Weather Bureau (CWB) in Taiwan are used. The Community Land Model (CLM from NACR) is also used to study the land hydrology. The model driven by prescribed precipitation is used to simulate soil water and runoff. Preliminary results show that the peak of simulated runoff was higher than the observation during a rainfall event. After the peak, however, the simulated runoff is lower than the observation. This implies that the model response to precipitation is too fast and the ground runoff (R_g) is too strong to retain water in soil. Soil, thus, has little memory of the previous rainfall. Experiments with 18 plant types are performed to examine the effect of plant on land hydrology. The result indicates that the effect of plant is small. A serial of sensitivity test will be performed to further examine the land hydrology over Taiwan.