

Climatic analysis of cloud system and precipitation over South China Sea

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Abstract

South China Sea (SCS) is the key location between Asian winter/summer monsoon and tropical low frequency system interaction. The cloud and precipitation signal also owns the intra-seasonal pattern and diurnal oscillation of convection over surrounding lands. The meteorological observation on Dongsha Island and Taiping Island is not continuous and not easy to make statistics analysis. The numerical analysis is also difficult to be validated. This study collects all the existed record from governmental resources, and converts them into MySQL database for analysis. The CFSR grid dataset (1979~2010) from NCAR was used for surface wind analysis over SCS. ECMWF reanalysis was also used to calculate U_{SCS} index of monsoon feature on 850hPa level. The satellite retrieval products (14 parameters, 1980~2014) from TRMM was analyzed and DAR-DAR MASK (a multi-satellites product) was also collected to analyze the vertical distribution of cloud amount and types. The results show the onset peak of Eastern Asia summer monsoon happens at the third and fifth pentad in May. The transition of weather patterns includes the increasing south-wind component, cloud cover northward extension from Borneo. After summer monsoon onset, significant low-level wind convergence exists around 20° latitude north and has more convective rainfall in South China Sea. After October, Dongsha Island has north-component wind and the rain-band moving southerly from November to January, staying at south of 8° latitude north in February. From the features of humidity and wind speed, Taiping Island locates at the transition zone of mid-latitude westerly wind flow and tropical easterly wind flow. It plays the key location between summer and winter monsoon exchange.