

The Rainfall in the Pre-monsoon over the Indochina Peninsula

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The rainfall in Pre-monsoon over the Indochina Peninsula was investigated using the daily mean reanalysis data, the OLR (Outgoing Longwave Radiation) data and rainfall data in 1998. In early April, middle April and early May (Pre-monsoon season), the lower OLR region extended southward from the mid-latitude zone to the Indochina Peninsula. The interval of southward extension was about 10-20 days. After the periodic convective activity, the lower OLR region migrated northward from the low-latitude zone in middle May. After that, the major part of the Indochina Peninsula was under the lower OLR area. The spatial scale of the periodic convective activity before the monsoon onset was not local, but synoptic. The southward extension of the cold air at 600hPa occurred periodically in accordance with the periodic convective activity. According to the time series of specific humidity in the inland area of the Indochina Peninsula (12.5-22.5N, 100-110E) and zonal wind along 110E (12.5-22.5N) at 850hPa, peaks of specific humidity from April to early May coincided well with the periodic convective activity over Thailand. During this period, when zonal wind was easterly from the South China Sea specific humidity increased. On the other hand, after the monsoon onset, specific humidity increased when zonal wind was westerly. Furthermore according to the distribution of the specific humidity and wind at 850hPa from 1st to 3rd April in 1998, the moisture inflow from the South China Sea came along the edge of the North Pacific high. We calculated the time-latitude section of lapse rate between at 700hPa and at 600hPa, and between at 850hPa and 700hPa, respectively. Between at 700hPa and at 600hPa, the unstable conditions existed at the periodic convective activity. It was suggested that weakening of strong inversion layer. While between at 850hPa and at 700hPa, it was found that the unstable condition of the lower layer was cyclic in pre-monsoon season. The unstable conditions existed before the periodic convective activity. Then after the rainfall the lower layer became stable. But after the monsoon onset, such unstable conditions did not exist at the lower layer.

It was found that the cold air extended southward before the periodic convective activity. Further it was clear that the easterly belong the edge of the North Pacific high from the South China Sea brought in the increase of moisture in the inland area of the Indochina Peninsula. It was suggested that the periodic convective activity in pre-monsoon season was related with the southward extension of cold air from the mid-latitude zone and the increase of moisture in the inland area of Thailand from the South China Sea. Furthermore, according to investigate the unstable condition, the unstable condition of the middle layer (about 3-4km) and of the lower layer (about 1.5-3km) existed at and before the periodic convection, respectively. We suggested that the heating of the surface and the inflow of the cold air produced the lower and the middle unstable condition, respectively.

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