

台灣梅雨平均結構之個案研究

A Synoptic Case Study on Mean Structure of Mei-Yu in Taiwan

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I. INTRODUCTION

Climatological data show that the annual rainfall distribution in the southeastern China possesses a relative maximum during the period of May and June. Continuous or intermittent precipitation is the characteristic feature in this rainy season. A similar phenomenon is found in central and eastern China and Japan with various time lags (e.g. Ramage 1971). It is called "Mei-Yu" or "Plum Rain" in China and "Baiu" in Japan.

Daily surface weather maps often indicate that a slow moving (or stationary) front runs from the vicinity of Japan southwestward into southern China. This front is often termed as "Mei-Yu front" or "Baiu front" locally. Satellite pictures also reveal the nearly continuous cloud band along the front. A series of disturbances at different scales, ranging from hundreds to thousands kilometers, is frequently observed to propagate along this front northeastward.

Numerous works have been done on various aspects of Baiu front and its associated disturbances in the vicinity of Japan during the Baiu season over the last decade (e.g. Gambo 1970a, b, Matsumoto et al 1970, 1971, Nitta et al 1974). On the other hand, a relatively small amount of works is accomplished

on the similar phenomena in southeastern China. Much work remains to be done on the structures and dynamics of the weather systems during Mei-Yu season in southeastern China in addition to the traditional climatological studies. Thus, a case study was carried out to better understand the mean structure of circulation systems during the ending period of Mei-Yu season in Taiwan. Observational data were analyzed to show the detailed distribution of horizontal winds, moisture and vertical motions. In addition, a kinetic energy (KE) budget study was made to reveal the role of different processes in the area during the period of interest.

II. CASES AND DATA

Cases have been chosen over the southeastern China and its vicinity including Mongolia, Korea, Japan, Indochina and southwestern North Pacific area. These areas have reasonably good coverage of surface and radiosonde observations except over the ocean. The area of interest is roughly bounded by 10° N and 55° N, 85° E and 150° E as shown in Fig. 1. There are a total of 140 radiosonde stations and 39 pibal stations within the region. Numerous surface and radiosonde data in the neighboring area were also used to help the analyses. These data were provided by the Chinese Central Weather Bureau on the coded form directly transmitted from Japan Meteorological Agency through a communication satellite.

Surface and mandatory level maps and NOAA 4 satellite pictures as received from Chinese Air Force Weather Central, through a cooperative program, were used in the case selection for Mei-Yu season. These were checked to see if there was a typical Mei-Yu front, a cloud band along a nearly stationary front, in the vicinity of Taiwan and southern China. Also, the hourly rainfall observations over the surface stations in Taiwan were used to identify the characteristic feature of continuous to intermittent rains.

Cases of 6-day period from June 10 to June 15, 1975 appeared to be a rather well-defined Mei-Yu regime in Taiwan.

In view of the characteristic features revealed in the present study of Mei-Yu, a diagnostic study on individual case is thus needed to better understand the dynamics of the circulation systems in Mei-Yu regime. This has been done and will be presented on the other paper. The consistency of the results among averaged fields indicated the accuracy of initial data analyzed. This will insure the results and conclusions of a diagnostic case study be more representative.

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摘 要

本文係對台灣梅雨季末期天氣系統平均結構之個案研究。除討論各氣象因子之分佈特徵外，並討論梅雨區內動能之收支情形。