

華南中尺度對流系統的次綜觀環境之分析與模擬*

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摘 要

中尺度對流系統 (Mesoscale Convective System, 簡稱 MCS) 是臺灣梅雨季造成豪雨的主要天氣系統, 1981 年 5 月 27 - 28 日臺灣北部的豪雨就是最近造成嚴重災害的個案之一。在此個案中有一些中尺度對流系統在華南發展, 而梅雨鋒上最大的一個中尺度對流系統乃為本文主要研究的主題。

利用衛星、傳統資料以及 NCAR/PSU 中尺度模式, 分析與模擬此中尺度對流系統發生前之環境以及有關中尺度對流系統之演化過程。研究結果顯示華南梅雨鋒上之中尺度對流系統與美國 MCC 在環境及演化過程上有相似的特徵, 而華南梅雨鋒上之中尺度對流系統的形成及發展與梅雨鋒的強迫作用以及西南方高相當位溫空氣流入有關。水汽潛熱釋放和地表通量在中尺度對流的發展占很重要的地位, 研究結果亦顯示 NCAR/PSU 中尺度模式有能力模擬出華南中尺度對流系統。

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**ANALYSIS AND SIMULATION OF THE SUBSYNOPTIC-SCALE
ENVIRONMENT OF A MESOSCALE CONVECTIVE SYSTEM
OVER SOUTHEASTERN CHINA**

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ABSTRACT

The heavy rainfall producers during the Mei-Yu season in Taiwan area are the Mesoscale Convective Systems (MCSs). One of the recent event caused severe damage is the case of 27-28 May, 1981. In this case, there were a few MCSs developed in southeastern China. The largest one of MCSs along the Mei-Yu front is a major topic of this study.

Satellite, conventional data and NCAR/PSU mesoscale model were used to analyze and simulate the pre-convective environment and the evolution of an MCS developed along a Mei-Yu front. The results show that the environment and evolution of MCS along the Mei-Yu front is similar to those of MCC in U.S.. The formation and development of this MCS is associated with the Mei-Yu front forcing and southwesterly high equivalent potential temperature (θ_e) airflow. The latent heat release and surface fluxes are very important factors in the development of MCS. We also demonstrated that the NCAR/PSU model has a potential ability to simulate MCSs in southeastern China.