台灣北部豪雨時空分佈特性

曾鴻陽　曲克恭

中國文化大學氣象學系

摘　要

　　利用1976年至1987年形成台灣北部地區豪雨14次颱風個案及1979年至1986年8次梅雨個案之逐時雨量資料，分析大雨量隨空間分佈的形式。根據分析結果，颱風及梅雨系統均可在大屯山區、基隆河中上游、南北勢溪及大漢溪流域山區中形成大雨中心，但梅雨系統亦可在桃竹地區之平地地區形成大雨中心。除分析個案之降雨深度(D)與面積(A)及延時(D)之關係外，並研討各分區中，不同延時平均降雨量（深度）與面積之異同。發現在大雨區中，可利用中心雨量（P_0）推算一定面積(A)上之平均降雨深度，各分區有不同的計算常數。根據日本水工學者石黑政儀所創「降雨歷程線計算法」求出各大雨個案時，選擇大雨區中代表性測站之降雨歷程線。此法簡易可行，對每一測站言，計算之歷程線以及所推算的每小時平均降雨強度與實際降雨歷程之分佈有相當良好的配合，但公式中之二常數值隨降雨總延時，總降雨量及雨峯而變化，故在本研究之分區中此二常數之變化界限極大，很難獲得統計上的通用值，顯示地形複雜的山區間一次大雨，雖在同一流域中，各測站之降雨歷程分佈均不相同，而且在整個降雨過程中，雨峯發生的時距亦有差異，豪雨時間分佈是一難題，值得繼續深入探究。

　　本文已發表於大氣科學（1989）十七期第三號，237-255。

Heavy Rainfall Distribution in the Northern Taiwan

Tzing Hong-Yung   chu Ko-Kung

Department of Meteoroeogy
Chinese Cultual University

ABSTRACT

Numerical expressions of the spatial distribution and the Depth-Area-Duration relationshiip of the heavy rainfall during Typhoon and Mei-Yu seasons in northern Taiwan were studied by using 14 typhoon cases from 1976 to 1987 and 8 Mei-Yu cases from 1979 to 1986. Meanwhile, mathematical expressions of the hyetographs measured by each of the selected rainfall stations located in the heavy rainfall area were calculated by following the method introduced by Ishigoro. We also studied the characteristics of the hyetographs and heavy rainfall patterns.

From this study, some primary results were obtained, such as (1) due to the special topographic features of northern Taiwan, typhoons will form heavy rainfall centers in some favorable mountain areas if they follow the tracks as shown by our cases, (2) if heavy rain is caused by a Mei-Yu frontal system, the heavy rainfall centers will always move with the front and some mesoscale systems and the moving heavy rainfall areas will easily form in the plain area west of the mountain, but sometimes the fixed heavy rainfall area also happens in the mountain area, (3) the area mean rainfall could by satisfactorily computed by using the maximum rainfall at the center of the heavy rain area and the two constants of the equation for each topographic regions in northern Taiwan were computed, and (4) the hyetographs computed by the Ishigoro method for individual stations fit the actual hyetographs well, but the two constants in the Ishigoro's equations greatly depend upon the total duration, total rainfall amount and the rainfall at the peak. It indicates that under the effect of the same typhoon or Mei-Yu frontal system, even within a single river valley the time distributions of heavy rainfall of the stations are very different.