嘉義地區冬季低雲的成因及其預報之研究

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摘　要

嘉義地區冬季（12、1、2、3月）低雲出現最爲頻繁，經蒐集統計30年（1965～1980年）嘉義地區地面觀測及16年（1965～1980年）地面天氣圖等有關氣象要素資料，在綜觀尺度分析下，並以個案探討校驗，結果發現嘉義地區之低雲可分爲四類：①高壓迴流型（佔4.8％）；②台灣低壓（含低壓波）型（佔6.5％）；③冷鋒型（佔18.5％）；另一種就是因冷頲風作用導致的低雲，故本文內定其名曰：「冷頲風型」低雲（佔70.1％）爲本研究之主要課題，此種「冷頲風型」低雲之成因爲：①由於嘉義地區在海、陸、山、川分佈之特殊情形下，當冬季受大陸冷高壓籠罩時，於傍晚時刻開始產生冷頲風，是促成低雲的主要原因；②山風與谷風作用；③海風效應；④陸風效應；⑤西螺大河噴風效用；⑥吹塵之影響；⑦高山積雪之影響；⑧低層空氣穩定潮濕。至於另外三種類型低雲之成因，與其他研究論述相同，在本研究內不予贅述。

「冷頲風型」低雲，幾乎均發生於終昏至始曉之間，尤以終昏及始曉兩個時刻最多，此種低雲之發生及消散均甚突然，持續的時間在數小時到十幾小時左右，一般於晨間八、九時即行消散。「冷頲風型」低雲之發生與綜觀尺度高壓中心位置、強度、等壓線走向，以及影響台灣各地氣壓值之變化，當地風向、風速、溫度、相對濕度等日變化密切相關，以中部氣壓值高於1012 mb；當地日間有西向風出現；溫度高於13° C以上；及相對濕度大於40％時均會發生低雲，尤以日間有正西風（風速3 K T S以上）；最高溫度在20° C — 26° C時最有利。（本文爲行政院國家科學委員會018號專題研究計畫N S C 74 — 0202 — M 072 — 10）。

A Study on the Cases of Low Cloud and Their Forecasting in cha-Yi Area During the Winter

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ABSTRACT

By analyzing the weather observations and surface weather chart at Cha -Yi Air Base, we found that the low cloud can be divided into 4 categories: (1)return flow of the Continental High (4.8%) (2) Taiwan low (6.5%) (3) cold front (18.5%) and (4) Bora wind (70.1%) which is the main interesting of this report to detect its characteristics and formation. From the research, it tells us that there are 8 reasons to cause the Bora typed low cloud. They are: (1) terrain effect by sea-land or mountain-river distribution. (2) valley wind (3) sea wind effect (4)land wind effect (5) jet effect in river Shi-Lo (6) blowing dust (7) snowdrift effect (8) stable-moistureair in lower atmosphere.

Bora typed low cloud almost happened during the night period and can be sustained to ten's hour and disappeared in the morning about 8 or 9 o'clock. Finally, we found that there are deep relationship among the position, intensity and ridge direction of the High Pressare Center as well as the diurnal change of the wind field, temperature, and humidity. Then we have the results as follow: when (1) the west wind is prevailed (2) temperature $>13^{\circ}C$ and (3) relative humidity $\geq 40\%$ are happened, it is easily to have the low cloud, especially in following case: (1) west wind greater than 3 Kts during daytime (2) temperature variation between $20^{\circ}C$ and $26^{\circ}C$.