

國立中央大學大氣物理研究所書報討論

Data : 2025/04/18

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A Climatological Study of Southwesterly Flows and Heavy Precipitation in Taiwan during Mei-yu Seasons from 1979 to 2018

Abstract

This study investigates the relationship between southwesterly flows and rainfall in Taiwan during the mei-yu seasons from 1979 to 2018. It finds a strong correlation between the occurrence of southwesterly flow events in southern Taiwan and heavy precipitation, while northern Taiwan shows little correlation. A strong northward pressure gradient, caused by low pressure to the north and high pressure to the south of Taiwan, promotes the development of southwesterly flows and rainfall. In active years, a weakened Pacific high allows moisture transport from both the Bay of Bengal and the southern flank of the Pacific high, increasing equivalent potential temperature and creating favorable conditions for mei-yu front activity. This sets off a positive feedback loop, enhancing southwesterly flows and heavy rainfall. The study also suggests using meridional water vapor transport over the South China Sea and the Philippines in early mei-yu season as a predictor for southwesterly flow events and rainfall throughout the season.

Keywords

SW(southwesterly flow)

Reference

Fang-Ching CHIEN, Yen-Chao CHIU, A Composite Study of Southwesterly Flows and Rainfall in Taiwan, Journal of the Meteorological Society of Japan. Ser. II, 2019, Volume 97, Issue 5, Pages 1023-1040, <https://doi.org/10.2151/jmsj.2019-057>.