Circulation patterns for southern Taiwan's summer monsoon rainfall during July to September

Ken- Chung Ko[1] and Yi-Shuan Tzeng
Department of Geography
National Kaohsiung Normal University
Taiwan 802

Abstract

This study analyzes the circulation patterns associated with summer monsoon rainfall over southern Taiwan during July-September in 1974-2001. Four types of monsoon systems, namely Monsoon I, I-TC, II and II-TC, are identified based on the daily rainfall data of 4 observational stations over southern Taiwan and the daily wind direction data of Lanyu. The total rainfall amount of Monsoon I and I-TC is much greater than that for Monsoon II and II-TC because the former two have more moisture. Monsoon I is characterized by strong southwesterly flow over southern Taiwan due to the tightening of the pressure gradient between the monsoon trough and subtropical high over the western North Pacific. The Monsoon I-TC pattern exhibits a deep monsoon trough along with an anomalous cyclone near the East China Sea, and this pattern drives lots of moisture that causes heavy rainfall over southern Taiwan. The circulation patterns of Monsoon I and I-TC resemble the flow pattern during Mei-Yu season. The Monsoon II and II-TC patterns reveal a trough south of Taiwan and accompanied by a strong ridge north to it. The convection is located near the southern flank of the monsoon trough. The Monsoon II and II-TC patterns are similar to the Pacific-Japan (PJ) pattern that can affect the weather in the East Asian summer monsoon area.

[1] *Corresponding author address*: Dr. Ken-Chung Ko, Department of Geography, National Kaohsiung Normal University, Kaohsiung, Taiwan 802. email: kko@nknu.edu.tw