

國立中央大學大氣物理研究所書報討論

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Modulation of convectively coupled equatorial Rossby wave on the western North Pacific tropical cyclones activity

Abstract

The study investigates the influence of the convectively coupled equatorial Rossby waves (ERWs) on tropical cyclones (TCs) in the Western North Pacific (WNP). It shows how ERWs modulate TC genesis, tracks, and intensity by examining changes in large-scale environmental conditions, with a focus on mid-level relative humidity and low-level vorticity

The results, with the period from 1998 to 2012 and concentrating on peak TC season from May to October, reveal that during the convectively active phases of ERWs, there's an increase in TC genesis and a higher daily genesis rate (DGR), while fewer TCs and a lower DGR are observed during the convectively inactive phases. Analysis of the budget terms of the total anomalous observed GPI reveals that mid-level relative humidity and low-level vorticity are the primary factor contributors, which could strongly suggest that ERW favor the TC genesis by altering the environmental conditions. Additionally, the tracks of TC tend to follow more north-westward and exhibit greater intensity during active phases compared to inactive phases.

Keyword

Equatorial Rossby wave

Reference

Zhao, H., & Wu, L. (2018). Modulation of convectively coupled equatorial Rossby wave on the western North Pacific tropical cyclones activity. *International Journal of Climatology*, 38(2), 932-948.