# 發展階段 T239 與 TCoSIT 模式的季內預報評估

陳雲蘭[1] 吳子榆[1] 童雅卿[1] 郭珮萱[2] 劉邦彥[1] 陳建河[2]
[1]中央氣象局氣象科技中心
[2]中央氣象局氣象資訊中心

## 摘　　要

中央氣象局(CWB)持續改進數值模式預報能力，T239(T239L60)為提高大氣模式解析度的測試新版全球海氣耦合模式，TCoSIT 則為一組簡易海氣模式，其在大氣模式中引入可結合雪、冰及水體(Snow/Ice/Thermocline)三相的 1 維海洋模式 SIT 來處理海氣的能量交換。為幫助了解發展中模式的預報改進能力，本報告以現行預報作業的全球海氣耦合模式(CWB1T R60/T119L40)以及全球大氣預報模式(CWBGFS T319)為基準，評估目前處於發展測試階段的 T239 與 TCoSIT 對於熱帶季內振盪 MJO 的預報表現。由於發展中模式並未有多年再預報資料，本研究僅使用 2017/2018~2019/2020 的 3 個冬季資料進行評估。初步結果顯示 T239 對 MJO 指數的預報能力可達第 3 週的期末，其預報得分優於 R60，預報能力大約提高 2 天。但對於在熱帶以外與 MJO 有關的東亞區冬季降水預報，T239 則未見帶來改進。現行預報作業的 CWBGFS T319 對 MJO 指數的預報能力大約只有 2 週，發展中的 TCoSIT 則可延伸至第 3 週，且其預報得分甚至優於 R60，惟 TCoSIT 的預報能力在進入第 4 週後明顯下降，對於第 3-4 週的預報，仍以 T239 及 R60 海氣耦合模式的預報較佳，且其趨勢表現亦較為穩定。

關鍵字: 全球海氣耦合模式、熱帶季內振盪

# Evaluation of MJO prediction skill for CWB developing models: T239 and TCoSIT

**Yun-Lan Chen, Tzu-Yu Wu, Yea-Ching Tung, Pei-Hsuan Kuo, Pang-Yen Liu, Jen-Her Chen**
**Central Weather Bureau, Taiwan**

## Abstract

This study evaluates the MJO prediction skill for CWB T239 and TCoSIT, both are in their developing stage. T239 is a fully coupled model by using CWBGFS T239L60 coupled with GFDL MOM3, it is a higher resolution version comparing to the CWB current operational short-term climate forecast model CWB1T R60/T119L40. TCoSIT was developed by using the CWB next generation high resolution CWBGFS TCo model coupled with a one-dimensional type ocean model SIT (Snow/Ice/Thermocline). 3-year (2017/2018 ~2019/2020) retrospective forecast data was prepared for this evaluation, which is far from the need of the standard model prediction skill assessment but is good enough for a preliminary check of the developing models. By verifying the MJO index prediction, the result shows T239 has good skill up to the whole 3rd week, and its performance is better than R60, the overall improvement is about 2 days. Nevertheless, little improvement was found from T239 in terms of the MJO associated rainfall pattern over East Asia. The developing TCoSIT model shows much better MJO prediction skill than the uncoupled CWBGFS T319, and its skill in the 3rd week even surpasses R60. Nevertheless, TCoSIT loses its skill quickly in the 4th week. As far as the week3-4 forecast is concerned, the preliminary analysis of this study shows T239 and R60, the 2 fully coupled models, have better MJO prediction skill and more stable forecasts than the uncoupled model CWBGFS and the 1-D ocean coupled model TCoSIT.

Keywords: Coupled model, MJO