

暖化情境下聖嬰對東亞氣候影響之機制探討

Discussion on the influence of the ENSO with the climate of East Asia in the warming

林昱緯¹ (Lin Y.-W.) 江鈞¹ (Chiang.-J.) 洪志誠¹ (Hong C.-C.)

¹臺北市立大學
¹University of Taipei

摘 要

研究顯示聖嬰引起的海溫變化是東亞夏季季風年際變化的主要驅動力之一；研究也顯示簡易大氣模式，SPEEDY(Simplified Parameterizations, primitivE-Equation DYnamics)是一個簡易有效能掌握聖嬰海溫對引起大尺度環流變化的模式。本研究將利用SPEEDY設計實驗了解暖化情境下聖嬰現象對東亞氣候影響之未來推估。本實驗設計以觀測聖嬰海溫距平，分別疊加在不同氣候狀態，包括：現今氣候、現今氣候均勻增溫1°C、2°C、4°C以及CMIP6模擬推估21世紀末的氣候態驅動模式；再藉由模擬資料的比較，探討不同氣候態底下，聖嬰海溫對東亞氣候影響的差異。初步結果顯示，SPEEDY模擬出的現今氣候能大致掌握聖嬰海溫引起的大尺度環流變化；透過回歸分析，也顯示與觀測氣候有大幅度的相似。

關鍵字：東亞、聖嬰現象、SPEEDY、暖化

Abstract

The researches have shown the sea temperature change caused by ENSO is one of main driving forces of the East Asian monsoon interannual variability ; the researches also have shown that the simple atmospheric model,SPEEDY (Simplified Parameterizations, primitivE-Equation DYnamics) is an effective tool for capabling of grasping large-scale changes in circulation induced by sea temperature of ENSO. This research will use SPEEDY to design experiment for understanding the future estimation of the impact of the ENSO on the East Asian climate in the warming. This experiment uses the same sea temperature (anomaly) of the observation of ENSO, superimpose on different climate states to driving model , including: the current climate, the current climate uniformly increased by 1°C, 2°C, 4°C and simulation of the warming in the end of the 21st century in the CMIP6. Then, through the comparison of simulation data, understand the changes in the influence of the ENSO in East Asia under the warming scenario. By comparing the simulation data, we will discuss the differences in the influence of the sea temperature of ENSO on the climate of East Asia under different climatic conditions. Preliminary results show that the current climate simulated by SPEEDY can roughly grasp the changes of the large-scale circulation caused by the sea temperature of ENSO. Through regression analysis, it also shows a similar result to the observed climate.

Key words: East Asia, ENSO, SPEEDY, warming