

國立中央大學大氣物理研究所書報討論

Date : 2024/10/04

Location : S1-713

Speaker : Chia-Yi Liu

Advisor : Prof. Li-Chiao Wang

Asymmetric impact of the boreal spring Pacific Meridional Mode on the following winter El Niño-Southern Oscillation

Abstract

El Niño-Southern Oscillation (ENSO) is the strongest air-sea coupled system on earth. In order to predict the occurrence of ENSO successfully, it is of great importance to investigate possible factors related to ENSO event. In the past, many studies have indicated that the springtime Pacific Meridional Mode (SPMM) has a close relation to the subsequent winter ENSO. Therefore, in this study the researchers would pay the attention on the asymmetric features of the SPMM and its impact on the following ENSO event. Furthermore, they also examined the contributing cause of the asymmetric relationship between the SPMM and ENSO.

During the +SPMM years, the stronger atmosphere-ocean interaction would induce strong westerly wind anomalies, which lead to significant and positive SSTAs resembling El Niño pattern appear via oceanic advection and eastward propagating equatorial downwelling Kelvin wave. However, the La Niña-like pattern cannot be simulated during the -SPMM years due to the weak WES feedback. They also employed CESM-CAM5.3 to verify the asymmetric atmospheric response to SPMM-related SST. These experiments confirm the difference of atmosphere-ocean interaction for SPMM years over the PMM active area is determined by the spring mean SST through using the same SSTA but for the opposite sign to simulate.

Keywords

Pacific Meridional Mode (PMM)

Reference

Zheng Y, Chen W, Chen S, Yao S, Cheng C. Asymmetric impact of the boreal spring Pacific Meridional Mode on the following winter El Niño-Southern Oscillation. *Int J Climatol*. 2021; **41**: 3523–3538. <https://doi.org/10.1002/joc.7033>