

Tropospheric Biennial Oscillation of the Western Pacific Subtropical High and its Relationships with the Atmosphere- Ocean Interaction

Yunyun LIU

Beijing Climate Center, China, liuyunyu@cma.gov.cn

Ding Yihui, Gao Hui, Li Weijing

Presenter : Yunyun Liu

There is the significant period of tropospheric biennial Oscillation (TBO) over East Asian monsoon region in the inter-annual timescales, which has the important influences on climate in East China. Based on an series of the reconstructed indices which describes the western Pacific subtropical high (WPSH) objectively, this paper focuses on the TBO of WPSH, the key members of the East Asian Monsoon system, and its relationships with the tropic sea surface temperature (SST) and atmospheric circulation anomaly. The results are: (1) As an important interannual components of WPSH, the TBO time series has obvious differences before and after the late 1970s, and the variance contribution of the WPSH's TBO more significantly in the late 30 years. (2) The time-lag correlation between the WPSH's TBO and some key areas of the tropic oceans is more significant than the WPSH's original time series, with longer correlation duration. The western point index of the WPSH is earlier response to ENSO than strength index of WPSH, and the time-lag correlations is up to maximum after 3-5 months and 5-6months, respectively. (3) In the course of a cycle of WPSH's TBO, the occurrence of the El Nino-like anomaly in the tropic central-eastern Pacific in winter is always coupled with the weak East Asian winter monsoon, with the significant enhancing of the WPSH' TBO. In contrast, the La Nina-like anomaly in the central-eastern Pacific in winter is coupled with the strong East Asian winter monsoon, with the weakening of the WPSH's TBO. (4) In the TBO cycle, the tropic sea surface temperature anomaly and atmospheric circulations present the asymmetry distribution. The WPSH's TBO is more significant in the period of the developing El Nino-like anomaly in central-eastern Pacific than in the period of the developing La Nina-like anomaly. Therefore, when the SSTa in tropic is in the period of developing El Nino-like anomaly, the interannual component of TBO signal should be paid more attentions in the short-term climate prediction.