



Impact of the Intraseasonal Oscillation on Tropical Cyclone Genesis over the Western North Pacific

Lijun You (1), Jianyun Gao (2), Hai Lin (3), and Si Chen (2)

(1) Fujian Institute of Meteorological Sciences, Fuzhou, China (ylj16003@163.com), (2) Fujian Climate center, Fuzhou, China (fzgaojyun@163.com), (3) Recherche en Prévision Numérique Atmosphérique, EnvironmentCanada, Dorval, Quebec, Canada (hai.lin@canada.ca)

This study investigates the impact of the East Asian-western North Pacific (EAWNP) intraseasonal oscillation (ISO) on tropical cyclone (TC) genesis over the South China Sea (SCS) and the western North Pacific (WNP). The result indicates that the 20–70-day oscillation (EAWNP-ISO₁) mainly modulates the frequency of TC genesis, while the 10–20-day quasi-biweekly oscillation (EAWNP-ISO₂) usually influences the genesis location. The impacts of ISO are not only on the individual TC genesis but also on the intraseasonal variation of TC activity.

In order to better monitor and predict TC genesis, we group the ISO intensity into three categories (wet, normal, and dry) using the EAWNP ISO-1 index and classify the ISO location into three categories (south, middle, and north) using the EAWNP ISO-2 index. By combining these six categories, nine combinations are defined to further investigate how the ISO impact on TC genesis. It was found that, through affecting the strength of monsoon trough and the location of the western Pacific subtropical high, the ISO combinations modulate the thermodynamic conditions and lead to changes in frequency and location of TC genesis.

The relative contributions of four variables of the genesis potential index (GPI) tend to be dependent on ISO conditions. When the ISO conditions are favorable (unfavorable) to TC genesis, the mid-level humidity and low-level vorticity contribute positively (negatively) to the GPI anomalies over the SCS and WNP region, while the vertical wind shear, except for in the north SCS, and the potential intensity contribute negatively (positively). During the normal ISO conditions, the contributions of these four variables are generally weaker than those under the other two backgrounds.