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Impact of Intraseasonal Oscillation of the East Asian–Western North Pacific Summer Monsoon on Tropical Cyclone Genesis

Lijun You (1)

(1) Fujian Climate Center of CMA, Climate Assessment, China (ylj16003@163.com), (2) Fujian Climate Center of CMA, Climate Forecast, China (fzgaojyun@163.com), (3) Recherche en Prévision Numérique Atmosphérique, Environment Canada, Dorval, Quebec, Canada(hai.lin@canada.ca), (4) Fujian Climate Center of CMA, Climate Assessment, China(chensifuzhou@foxmail.com)

The East Asian–western North Pacific (EAWNP) intraseasonal oscillation (ISO) indices are used to study the impact of ISO of the EAWNP summer monsoon on tropical cyclone (TC) genesis over the western North Pacific. The result indicates that the 20-70-day oscillation mainly modulates the frequency of TC genesis, while the 10-20-day quasi-biweekly oscillation 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.

Nine EAWNP ISO conditions are defined to further investigate the impact of different ISO backgrounds on TC. It was found that, through affecting the strength of monsoon trough and the location of the western Paci[U+FB01]c subtropical high, ISO modulates the thermodynamic conditions and leads to changes in frequency and location of TC genesis.

The relative contributions of the four variables of the genesis potential index (GPI) tend to be dependent on the ISO conditions too. The mid-level humidity and low-level vorticity play leading and secondary roles, while the influence of vertical wind shear and potential intensity is relatively weak. In ISO conditions that 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 vertical wind shear, expect for in the north SCS, and potential intensity contribute negatively (positively). During the normal ISO conditions, the contributions of these four variables are generally weaker than under the other two backgrounds.