



Relationship between the intraseasonal IPCO and tropical cyclogenesis over the Indo-western North Pacific during summertime

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The influence of the intraseasonal Indo-western Pacific convection oscillation (IPCO) on the tropical cyclone (TC) genesis location and frequency over the Indo-western North Pacific during the summertime (May-October) is explored in this paper. Observational analysis shows that the impacts of the intraseasonal IPCO on TCs over the Indo-western North Pacific features in evident “locational phase lock of TC genesis” and distinct differences in TC frequency. In term of the WNP, when the intraseasonal IPCO is positive phase, there tends to be much more TCs, especially in the South China Sea (SCS), and more TCs generate in the west of the WNP and lower latitude (around 5°-20°N); vice versa. At the positive intraseasonal IPCO phase, the atmosphere gains heat through both sea-air interaction and the latent heat release of cumulus convective condensation, and the anomalous cyclonic circulation weakens the western Pacific subtropical high (WPSH), these conditions do favor the TC genesis. Moreover, the shrinking WPSH, the enhanced heat transfer from sea to air at the lower latitude as well as the westward shifts of heating center and anomalous cyclonic circulation lock TC genesis locations in the west of the WNP and lower latitude. The opposite situation occurs at negative phase. As for the North Indian Ocean (NIO), the TC genesis locations at the positive intraseasonal IPCO phase mainly situate in 13°-20°N and distribute closer to Indian Peninsula, particularly in the Arabian Sea (ARB), in contrast, the spatial distribution is more dispersed at the negative intraseasonal IPCO phase. However, the total TC frequencies at two intraseasonal IPCO phases are similar. These features come largely from the differences in the area featuring conditions between the northern and southern regions of 13°N in the NIO: at the positive intraseasonal IPCO phase, to the northern region of 13°N, the environmental conditions are similar to the case of the WNP except without the WPSH control, and the reversed situations are observed over the southern region of 13°N, which lead to northward shift of TC genesis location. The negative phase reflects an opposite situation.