

Interannual Variability of Mean Flow Energetics over the Western North Pacific during Typhoon Season

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Abstract

The summertime SST anomalies over the Central-Eastern Pacific are closely related to the interannual variability of tropical storm (TS) occurrence over the tropical western North Pacific (WNP). Accompanying with the warm SST anomalies shift eastward in the equatorial Central-Eastern Pacific, the westerly jet, monsoon trough, anomalous upward motion and diabatic heating all extend southeastward. The large-scale circulations modulated by summertime ENSO provide a favorable environment for TS occurrence. The maintenance of these large-scale anomalous circulations is investigated by the mean flow energetics in this study.

During the SST warm period, both the mean available potential energy (MAPE) and mean kinetic energy (MKE) increase over the WNP. The increment of MAPE in the tropics is mainly contributed by the generation of MAPE associated with the heightened diabatic heating over warm region. As the upward motion intensified, the MAPE converts to MKE to maintain the anomalous large-scale circulations. The enhancement of these anomalous circulations plays an important role for transient eddies growth because it provides a suitable condition for eddy baroclinic and barotropic energy conversions.