



## **Possible Linkage between Monsoon Trough Variability and Tropical Cyclone Activity over Western North Pacific: Role of Tropical Waves**

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The present study investigates the influence of the monsoon trough (MT) on the interannual variability of tropical cyclone (TC) activity over the western North Pacific during July–November for the period 1979–2007. It is shown that the TC activity is closely related to the MT location. During the years when the MT extends eastward (retreats westward), more (less) TCs form within the southeastern quadrant of the western North Pacific. Such a relationship can be explained by the changes in tropical waves, such as mixed Rossby–gravity (MRG) waves and (tropical depression) TD-type disturbances, associated with the movement of the MT. An eastward extension of the MT coincides with enhanced TD-MRG type disturbances and a clear MRG-to-TD transition over the southeast quadrant of the western North Pacific. Such a transition is unclear during the years when the MT retreats westward. These waves associated with the eastern extension of the MT are favorable for TC genesis, while those associated with the westward retreat of the MT are not. Diagnosis of the barotropic energy conversion indicates that both the rotational and divergent components of the background flow change associated with MT are responsible for energy conversion from the mean flow to the TD-MRG perturbations. This is an important reason for the linkage between MT variability and TC genesis over the western North Pacific.