

DIAGNOSTIC STUDY ON THE INTERACTION BETWEEN EAST ASIAN MONSOON CIRCULATION AND ENSO CYCLE IN THE TROPICAL PACIFIC

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Abstract

In this paper, the observed data for 1979-1994 are used to analyse and diagnose the processes of the interaction between East Asian monsoon and ENSO cycle during the occurrences of 1982/83, 1986/87 and 1991/92 ENSO events. The analysed results show that when the SST anomalously increased in the equatorial central and eastern Pacific, the convective activities can be intensified over the tropical central Pacific and can be weakened over the tropical western Pacific. This thermal structure is helpful to the formation of an anticyclonic anomalous circulation over the tropical western Pacific and the South China Sea. Thus, the anomalous Monsoon circulation and rainfall will be caused in East Asia.

The analysed results also show that before the occurrence of ENSO event, there are the obvious westerly anomalies in the lower troposphere over the equatorial western Pacific, and the westerly anomalies can excite the eastward-propagating warm Kelvin wave and the westward-propagating cold Rossby waves, which provide the necessary condition of oceanic waves for the occurrence of ENSO event. Moreover, after the onset of ENSO event, there are the obvious easterly anomalies in the lower troposphere over the equatorial western Pacific, which can excite the eastward-propagating cold Kelvin wave. This provides the necessary condition of oceanic wave for the decay of ENSO event.

These westerly and easterly anomalies over the equatorial western Pacific are closely associated with the equatorward propagations of the zonal wind anomalies from East Asian and Australian monsoon regions, which can be shown by the analyses of the observed data.

Key words: Asian monsoon, ENSO cycle, Interaction.