



Asymmetric Features for Two Types of ENSO

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ABSTRACT

There are two types of El Niño-Southern Oscillation (ENSO), namely, the eastern Pacific (EP) ENSO that is characterized by the warmest (coldest) sea surface temperature (SST) anomalies in the eastern equatorial Pacific, and the central Pacific (CP) ENSO whose maximum (minimum) SST anomalies are over the central equatorial Pacific. Asymmetric features of SST anomalies for the EP and CP types of ENSO events and their possible mechanisms were analyzed using a variety of data during the period of 1961-2010. The responses of atmospheric circulation to the two types of ENSO were also discussed. Results showed asymmetric features of SST anomalies in terms of spatial and temporal distributions and intensity. Although the dominant mechanisms differed at both development and decay stages, the oceanic vertical advection played a key role in the asymmetric intensity of the two ENSO events. In addition, both local and remote atmospheric responses showed strong asymmetric signals, which were consistent with the asymmetric distribution of SST anomalies. The asymmetric atmospheric responses in EP-ENSO (CP-ENSO) were similar to those associated with EP-El Niño (CP-La Niña). The intensity of asymmetric responses related to the EP-ENSO was much stronger than that related to the CP-ENSO.