



Influences of ENSO teleconnection on the persistence of sea surface temperature in the tropical Indian Ocean

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This study confirms a weak spring persistence barrier (SPB) of SSTA in the western tropical Indian Ocean (WIO), a strong fall persistence barrier (FPB) in the South China Sea (SCS), and the strongest winter persistence barrier (WPB) in the southeastern tropical Indian Ocean (SEIO). During El Niño events, a less abrupt sign reversal of SSTA occurs in the WIO during spring, an abrupt reversal occurs in the SCS during fall, and the most abrupt reversal occurs in the SEIO during winter. The sign reversal of SSTA implies a rapid decrease in SSTA persistence, which is favorable for the occurrence of a persistence barrier. The present results indicate that a more abrupt reversal of SSTA sign generally corresponds to a more prominent persistence barrier. El Niño-induced changes in atmospheric circulation result in reduced evaporation and suppressed convection. This in turn leads to the warming over much of the TIO Basin, which is an important mechanism for the abrupt switch in SSTA, from negative to positive, in the northern SCS and SEIO. The seasonal cycle of the prevailing surface winds has a strong influence on the timing of the persistence barriers in the TIO.

The Indian Ocean Dipole (IOD) alone can cause a weak WPB in the SEIO. El Niño events co-occurring with positive IOD further strengthen the SEIO WPB. The SEIO WPB appears to be more strongly influenced by ENSO than by the IOD. In contrast, the WIO SPB and the SCS FPB are relatively independent of the IOD.