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## Inter-decadal changes in the East Asian summer monsoon and associations with sea surface temperature anomaly in the South Indian Ocean

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Previous studies have revealed inter-decadal changes in the East Asian summer monsoon (EASM) that occurred around the late 1970s and early 1990s, respectively. The present study compares characteristics of these two changes and analyzes plausible influences of the South Indian Ocean (SIO) sea surface temperature (SST) change. The two changes share pronounced common features, characterized by an equivalent barotropic circulation anomaly over northern East Asia and a meridional vertical overturning circulation over the tropical region. Meanwhile, they display some distinct characteristics, especially over the tropics. The circumfluent anomalies are more robust for the first change than for the second one. Related amplitude asymmetry is partly attributed to a weakening trend in the EASM. Moreover, SST change in the SIO, featuring a decadal warming since the 1980s and a cooling after 1993, may contribute to both of these inter-decadal changes. Cold SST anomaly induces anomalous mid-tropospheric descent over the western SIO and ascent extending from the eastern SIO to Western Australia and over the equatorial Indian Ocean. The accompanying upper-tropospheric divergent flows from Western Australia and equatorial Indian Ocean to the Philippines lead to anomalous descent and an anomalous lower-tropospheric anticyclone over the South China Sea (SCS)–Philippines. Warm SST anomaly induces opposite changes in above regions. The possible influence of SST anomaly in the SIO is further confirmed by numerical experiments.

### Biography

Zhiping Wen has completed his PhD from University of Chinese Academy of Sciences, Beijing, China. He is the Director of Center for Monsoon and Environment Research, Sun Yat-sen University, Guangzhou, China. He has published more than 100 papers in reputed journals and has been serving as an Editorial Board Member of repute.

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