



Impacts of ENSO and local SST on Moisture Source in Asian-Australian Monsoon Region in Boreal Summer

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The El Niño-Southern Oscillation (ENSO) and local sea surface temperature (SST) have been regarded as the important factors influencing the precipitation, evaporation and circulation over the Asian-Australian monsoon (AAM) region. The moisture source is determined directly by precipitation and evaporation. The present paper studies the impacts of ENSO and local SST on moisture source in the AAM region in boreal summer. The relative roles of ENSO and local SST are also discussed by using the singular value decomposition (SVD) and conditional SVD (CSVD) methods. The authors identify one major coupled mode between the interannual variations of apparent moisture sink ($\langle Q2 \rangle$) and SST for the period 1979-2008. The spatial structure of the major mode exhibits two key regions of moisture source, one over the western-central southern Indian Ocean (SIO) where $\langle Q2 \rangle$ is negative and the other over the northwest and north side of Australia where $\langle Q2 \rangle$ is positive. In the corresponding map of SST, negative values are also seen in the former region, but positive in the latter region. The interannual variation of moisture source in the AAM region has an outstanding positive correlation with the local SST. Furthermore, ENSO also has a remarkable correlation with the principle component (PC) of the first empirical orthogonal function (EOF) mode of $\langle Q2 \rangle$. ENSO and local SST work cooperatively to determine the variations of moisture source in the AAM region.

Key words : ENSO, local SST, moisture source, the Asian-Australian monsoon region