

The meridional displacement of summer Asian jet, Silk Road Pattern, and tropical SST anomalies

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The Silk Road Pattern (SRP), which depicts the teleconnection pattern along the Asian jet, has been extensively investigated, and commonly described as the leading mode of upper-tropospheric meridional wind anomalies in summer. We identified that the SRP has a significant relationship with the meridional displacement of the Asian jet (JMD), which manifests as the leading mode of upper-tropospheric zonal wind anomalies. This relationship can be explained by the internal atmospheric dynamics. In addition, we find that the JMD is significantly affected by the tropical surface temperature anomalies. Particularly, the preceding spring SST anomalies in the tropical central and eastern Pacific affect significantly the summer tropical tropospheric temperatures, and thus induce the JMD through modifying the meridional gradient of tropospheric temperatures. The tropical tropospheric temperature anomalies can also affect the SRP through the JMD.

Key words: Silk Road Pattern, meridional displacement, Asian jet, SST, tropical Pacific