



Past and Future of Tropical Easterly Jet and its association with Indian Summer Monsoon

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The Tropical Easterly Jet (TEJ) is one of the important components of Indian summer monsoon (ISM) circulation, which is an upper tropospheric (70-200 hPa), easterly wind regime observed over the Indian Ocean (5N to 20N) during boreal summer monsoon season (June to September, JJAS). The core of the TEJ, with maximum wind speed, is centered around 10N at 100 hPa level. It originates over the Bay of Bengal and extends over the peninsular India and Indian Ocean region. In the present study, the changes in TEJ speed and location over the last century (1901-2005) is examined using the ERA-20C data as well as its future projections is made for the RCP 8.5 scenario. The TEJ is found to weaken in the last century, on the contrary, it will be stronger in the future and by the end of the 21st century, the maximum wind speed of TEJ will increase by ~ 8 m s⁻¹. The zonal component of TEJ is noted to be positively correlated with Indian summer monsoon rainfall and therefore the changes in the strength of TEJ is likely to have an impact on the future precipitation over India. The future projections of CMIP5 multimodel mean (MMM) show that the precipitation will increase with increasing mean wind speed of the TEJ under RCP 8.5 scenario. The JJAS surface air temperature over Tibet will be high in future, which helps in the strengthening of TEJ and therefore leading to heavy rainfall over India.

Keywords: Tropical Easterly Jet, Indian Summer Monsoon, CMIP5 MMM, RCP8.5, ERA-20C