



## **Spatial distribution and variation trend of thunderstorms in Asia based on TRMM data**

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Using 16-years (1998–2013) Radar Precipitation Feature (RPF) and Lightning data from Tropical Rainfall Measuring Mission (TRMM) observations, the spatial distribution and seasonal variation of thunderstorms in Asian Monsoon Region (AMR) are presented. Comparison shows that the distribution pattern of thunderstorm was similar with that of lightning density in low-latitude region. In mid-latitude region between 25-36°N, the thunderstorm presents an increasing trend from the west to east (from Tibetan Plateau to Eastern China), while lightning density shows an opposite pattern. Further analysis finds that the spatial distribution pattern of lightning is mainly affected by intense thunderstorm events (flash rate greater than 10. /min), reflected as the number of intense thunderstorms accounted for only 12% of all thunderstorms, but contributed 65% to total flash count in research region. Most regions of AMR has an increasing trend on thunderstorm variation, only a few regions presented a decreasing trend. The relative variation trends between the number of thunderstorm and lightning density have three types: (1) Thunderstorms and lightning density both increase (2) Thunderstorms increases and lightning density decreases; (3) Thunderstorms and lightning density both decrease. The factors caused these relative trends are worthy of further study and research.