

## **Temporal distribution of lightning activity over Indian region in different seasons**

(Topic: **Lightning Occurrence Relative to Meteorology**)

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It is well established in the recent years that lightning activity over a particular region is affected by prevailing meteorological and thermodynamic conditions, concentrations of cloud condensation and ice nuclei mainly controls over that region. Here, we present our study of temporal variation of lightning activity in different seasons over different parts of India using 19 years TRMM lightning data (1995 to 2013). The analysis indicates during this period, annual lightning activity over most part of India shows an increasing trend. Though, many studies in the recent years have shown that the monsoon circulation over Indian region is weakening, lightning activity shows sharp increase in last 19 years during monsoon season (i.e. June – September). The increase in lightning activity is very high over monsoon trough region. This increasing trend in lightning activity during monsoon suggests that the convective rainfall is increasing during monsoon over Indian region. In most part of India, increasing trend in lightning activity is observed during pre-monsoon season (i.e. March-May) whereas during winter (i.e. December , January and February ) and post-monsoon ( i.e. October and November) decreasing trend in lightning is observed. The thermodynamic conditions, prevailing meteorological conditions and aerosol concentration over Indian region during this period (1995-2013) have been studied to understand the factors responsible for trends in lightning activity observed during different seasons over Indian region. Our study suggests that the increasing trend in lightning activity observed in monsoon season can be attributed to the increase in aerosol concentration over this region; whereas, the increased trend observed during pre-monsoon can be attributed to the increased Convective Available potential Energy (CAPE) and moisture content over Indian region in this period.