



Morphology of upward lightning discharges (the TLEs) from Indian Subcontinent

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It is well known that terrestrial lightning discharge produce luminous emissions high above thunderstorms and these emissions electrically connect earth's troposphere to ionosphere. These high altitude luminous phenomena of varied luminosity and geometrical shapes are collectively known as Transient Luminous Events (TLEs). During last three decades ground and aircraft campaigns were carried out across the globe for studies of TLEs, but none in Indian region. It is important to note that on the global scale Indian subcontinent is the part of tropical regions, and hence lightning flashes occurrence is very intense in this part of the world. Hence is an important region for TLEs observations and studies.

A camera system for observations of TLEs, the very first experiment was deployed in India by the Indian Institute of Geomagnetism (IIG) in 2012. The site is outside the city of Allahabad at 25.4°N, 81.9°E, a location from which the cameras cover thunderstorm activity in the middle of Indo-Gangetic plain. Observations from 2012 onwards have resulted in the observation of all known form of TLEs. All the TLEs recorded were observed over the thunderstorm during the monsoon season in India. This made us to understand the property of TLE producing lightning discharges during monsoon season in India, and understand the distinct features of India TLE observations when compared with global studies. The presentation will focus on presentation of observation, simulation and meteorological analysis on some of the unusual form of TLEs observed in India like gigantic jets, blue jets, sprites, etc.