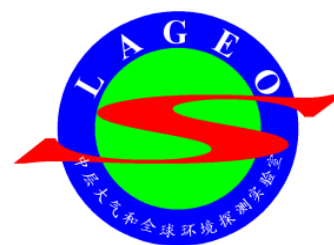




中国科学院 大气物理研究所
中层大气和全球环境探测重点实验室



中层大气和全球环境探测论坛

Colloquiums of Middle Atmospheric and Global Environment Observation

(05)

Investigating the Physical Nature of Lightning-initiating Events

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摘要: How lightning is initiated inside thunderstorms is a long-standing, important question in atmosphere science. It has been shown that compact intracloud discharges (CIDs)/narrow bipolar events (NBEs) can initiate lightning, but their physical nature is poorly understood. Breakthroughs in the study of CIDs/NBEs have been made recently by using broadband radio interferometers. In particular, fast electrical breakdown, which develops at a speed reaching one fifth the speed of light, is found to be responsible for producing CIDs/NBEs. It has also been hypothesized that the fast breakdown process consists of a large system of streamers. This talk will present broadband radio interferometer observations of CIDs/NBEs in Florida in Summer, 2016 and 2017, which confirm CIDs/NBEs are caused by fast breakdown. A statistical approach to model the discharge properties and radio emissions of a large system of streamers will also be discussed. The modeling results indicate that a system of about ten million streamers can explain the current, charge and radio spectrum of CIDs/NBEs, providing strong support of the hypothesis that CIDs/NBEs are a system of streamers.

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