

ELF-VLF帯電界と静電界の同時計測に基づいた積乱雲の帯電と放電の監視

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Monitoring of charge and discharge in thunderstorm based on electrostatic measurement and radio observation in ELF- VLF bands

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Recently, several networks to monitor lightning activity have been newly constructed to utilize lightning data for nowcast of severe weather associated with thundercloud, such as heavy rainfall, tornado, and downburst. By using established observation network, activity of cloud-to-ground (CG) lightning discharge whose electromagnetic radiation is enough strong has been mainly monitored. One of the most remarkable progresses in the recent lightning observation is a total lightning observation, which makes it possible to detect not only CG lightning discharge but also intracloud (IC) lightning discharge. Preceding studies indicates that IC lightning discharge occurs in the early stage of thunderstorm activity. Detection of IC would be one of the most effective ways for the nowcast of thunderstorm activity that causes severe weather.

Main interest of this study is the relationship between electrification and discharge in thundercloud. For early detection of thunderstorm activity, detection of electrification before lightning discharge is examined. As an observation of lightning discharge, electric field associated with lightning discharge is measured with radio observation in ELF-VLF bands and slow antenna system. As a monitoring of thunderstorm electrification, measurement of electrostatic field is carried out. Sensors to measure electrostatic and electric fields have been already distributed in the Kanto region, Japan. In this presentation, results of simultaneous measurement of electrostatic and electric fields during summer season in 2016 are summarized.