

栃木県足利市における雷雲観測を目的とした静電界計測網の構築

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Construction of electrostatic measurement network for thunderstorm observation in Ashikaga City, Tochigi Prefecture

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In the recent, lightning observation has been considered as an effective and low-cost tool to carry out early detection and short-term forecast of thunderstorm which causes extreme weather events, such as tropical cyclone, torrential rainfall, etc. Previous studies indicated that detection of intracloud (IC) lightning discharge which occurs before cloud-to-ground (CG) lightning discharge was a key technology for nowcast of extreme weather events.

Detection of thunderstorm electrification before IC based on electrostatic measurement is also focused on as an effective method for early detection and nowcast of thunderstorm activity. However, preceding studies also pointed that not only thundercloud but also charge nearby sensor could be detected in electrostatic measurement due to high sensitivity. Although electrostatic measurement would be effective especially for nowcast of lightning discharge, it remains at the research stage because of the difficulty of operation.

In this study, we have newly deployed simple and low-cost electric field mill (EFM) to construct multiple electrostatic measurement network in Ashikaga city, Tochigi Prefecture. Previous meteorological research indicated that Tochigi prefecture is one of the most intense regions for thunderstorm activity in Japan. In this area, several isolated thunderclouds could be monitored during a summer. If isolated thundercloud can be observed by multiple electrostatic measurement, development of electrification in cloud would be derived quantitatively as an inversion problem. In this presentation, details of test observation and status of EFM deployment is summarized.

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