Monitoring of lightning activity with the combination of radio observation in ELF-VLF band and electrostatic measurement.

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In the recent, heavy rain and lightning associated with thunderstorm become a representative of severe weather in urban region. Lightning observation has been focused on as an efficient tool to monitor thunderstorm activity.
Main objective of this study is to established methodology for early detection of thunderstorm formation with simple and low-cost system. To observe lightning activity, electromagnetic field radiated from lightning discharge in ELF (Extremely Low Frequency: less than 3 kHz) and VLF (Very Low Frequency: 3-30kHz) bands has been measured. ELF-VLF wave can propagates long distance (more than several hundreds kilometers). Receivers are installed about 100 km apart in the Kanto Plan, Japan to make detection sensitivity to be high.
In this presentation, initial results of the combination of radio observation in ELF-VLF band and electrostatic measurement are summarized. As an electrostatic measurement, flat-plate sensor called as slow antenna is newly developed and installed at Machida, Tokyo. Based on the comparison between electric field data and electrostatic one, detection sensitivity and discharge-type identification of radio observation in ELF-VLF bands is validated.

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