

Spatio-temporal characteristics of lightning energy in Southeast Asia deduced from ELF observations

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In the Southeast Asian region, cloud-to-ground discharges cause several million dollars of damage per year. Detailed information on electrical characteristics and spatio-temporal distributions including lightning stroke energy in the relevant region is essential for lightning disaster mitigation. In this study, we investigate the spatio-temporal characteristics of cloud-to-ground discharges in the Southeast Asian region, including the charge moment change, by using the lightning locating system in combination with the ELF magnetic field observation installed at the University of Pahang, Malaysia. Specifically, we identify the spheric waveforms in ELF band corresponding to the lightning strokes detected by EarthNetworks's total lightning detection network. Then we calculate the lightning charge moment Qds , lightning peak current, and polarity for each stroke. In this presentation, initial results on spatio-temporal characteristics including Qds for lightning strikes around Malay peninsula for different seasons will be presented.

Keywords: Lightning strike, ELF magnetic field, Charge moment of lightning strikes, Transient luminous event, Atmospheric electricity, Southeast Asia