

# Lightning and Radar Observation for Severe Weather Mitigation

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This presentation reviews recent progress in lightning and radar observation for severe thunderstorm, and focus on the relationship between lightning and thunderstorm characteristics. The relationship between lightning flash rate and storm height has been investigated to predict the lightning production from cloud observation. Physical basis to support the relationship comes from the theory that the flash rate is strongly affected by the strength of the charge separation and the geometry of the charge distribution, in which vertical air motion plays a fundamental role. Hence, the flash rate is expected to depend on the intensity of the vertical air motion that is closely related to the storm height. As a practical matter, a case study shows that the flash rate increases as the updraft intensifies and the storm height develops [Goodman et al., 1988]. However, both theoretically and experimentally established correlation between storm height and flash rate is rare. In this study, the relationship between cloud height and lightning flash rate is examined on a global basis using data from the Tropical Rainfall Measuring Mission (TRMM) satellite.