Remote imaging and lightning analysis

Roice Nelson, Les Denham, Jim Siebert (Dynamic Measurement LLC)

Lighting analysis is based on triangulating each lighting strike location and measuring time and electrical characteristics of each lightning strike by 5-30 sensors. These sensors can be 600+ miles away, or half the distance of a low-Earth orbit satellite. Lightning analysis is remote imaging too. The NSEM (Natural Sourced Electromagnetic Method) is based on passive remote sensing of the most powerful natural electromagnetic pulses on planet Earth. Sensors have been measuring lightning strikes since 1983, before widespread adoption of workstation technologies. Passive lightning strike measurement technology was initially developed for meteorological research by Dr. Richard Orville (https://journals.ametsoc.org/doi/pdf/10.1175/BAMS-89-2-180). The data were quickly adopted by insurance companies, who did not want to pay claims on damages not caused by lightning. This business driver resulted in the privatization and commercialization of the NLDN (National Lightning Detection Network: https://www.vaisala.com/en/products/data-subscriptions-and-reports/data-sets/nldn), and about six years ago the GLD-360 (Global Lightning Database – 360: https://www.vaisala.com/en/products/data-subscriptions-and-reports/data-sets/gld360). The primary commercial basis for these databases is insurance, safety, and meteorology (including television weather reporting of lightning storm locations).