J O U R N A L C L U B

Los Alamos Sferic Array Lightning Studies

by

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ABSTRACT

The Los Alamos Sferic Array consists of eleven VLF electric field change meters that have been operated continuously since Spring 1997, in New Mexico, Texas, Florida, Colorado, and Nebraska. The primary purpose for the design and deployment of the Los Alamos Sferic Array (LASA) has been to support observations by the FORTE (Fast On-orbit Recording of Transient Events) satellite, which has both VHF and optical sensors. Electric field change data from the LASA stations are used to locate, classify, and parameterize as many as 20,000 lightning discharges per day. I will describe FORTE and LASA instrumentation and lightning observations and then focus on discussion of inter-comparisons between LASA and other data sets used to gain insight into lightning phenomenology.

In April 1998, five sferic array stations were located in Florida, one of the specific purposes being to attempt coincident observations with the Kennedy Space Center Lightning Detection and Ranging (LDAR) system. Prior to the 2000 North American summer, three of the LASA stations were moved to Colorado for the purpose of conducting coincident studies with the wide range of instruments that were part of the Severe Thunderstorm Electrification Study (STEPS) campaign, and specifically with the Lightning Mapping Array (LMA) operated by New Mexico Tech. Both the LDAR and LMA sensors record VHF emissions associated with lightning discharge processes (at 66 MHz). The Los Alamos Sferic Array electric field change meters record sferic (VLF) signals (between 300 Hz - 500 kHz). Understanding the relationship between the LDAR and LMA VHF observations and the much lower frequency lightning observations of the Los Alamos Sferic Array provides insight into lightning discharge processes, and specifically into interpretation of coincident FORTE (VHF) and National Lightning Detection Network (VLF) observations (which I will briefly discuss).

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Globe Room, Elvey Bldg.
3:45 pm