Positioning of Electrical Tropical Thunderstorms in antennas VLF through Google Earth and Time of Arrival

Lightning Detection Technologies

Freddy Narea, Luis Moreno, Nelson Falcón (Laboratory of Physics of the Atmosphere and Outer Space, Department of Physics, University of Carabobo FACYT PO Box 129 avda Bolivar Norte Valencia Edo. Carabobo Venezuela; nelsonfalconv@gmail.com) Amilkar Quintero (Physics Department, Kent State University, USA; aaqs01@gmail.com)

The lightning produced an electromagnetic pulse propagating in the atmosphere and can be measured in the range of 3kHz - 30kHz (Very Low Frequency) . In order to study its electromagnetic pulses and characterize the components of the signal corresponding to the VLF band , were built four double loop antennas with a PA system and band pass filter NE5534 to evaluate the Local keraunic level . Using the technique Time Of Arrive (TOA) calculations based on hyperbolic curves . Given the differences in the times of events and records the exact location of antennae location, an algorithm was Implemented in the Matlab programming language to analyze information and software linked to Google Earth to visualize the localization of the discharges on this platform. And so to monitor the occurrence of lightning in the area . Additionally, tests presented to the dual-type receiving antenna loop for checking its operation, and comparison of the experimental results with the simulation of the antenna by software MMANA -GAL . We conclude that the antennas capture the magnetic components of the electromagnetic pulse signals in the VLF band in the range of 3 kHz to 25 kHz , and allows to analyze the intensity and frequency of the local keraunic level during tropical storms . This project has been funded through the Strategic Project FONACIT 2011-000326: Characterization of Transient Phenomena in the Lower Troposphere., Ministry of Science and Technology of the Bolivarian Republic of Venezuela.

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