

## **Infrasonic Pulses and Charge Centers from Lightning**

### **Lightning Physics**

Rene O Arechiga (New Mexico Tech, 801 Leroy Pl. Socorro, NM 87801, USA; [rene@ee.nmt.edu](mailto:rene@ee.nmt.edu)), Jeff L Lapierre, Michael Stock, Hector Erives, William Rison, and Ronald J. Thomas

Infrasonic pulses are very low frequency pulses embedded in a thunder signal emitted by a lightning flash. They are known to be very high energy with pressures on the order of 1 Pa. According to Holmes et al. [1971], the mechanism of thunder production by a thermally driven expanding channel proposed by Few in 1967, could not explain the high-energy low-frequency peaks of some cloud-to-ground and most intracloud discharges. To explain their occurrence, they proposed the electrostatic mechanism of C.T.R. Wilson. In this work we compare the location of infrasonic pulses with the charge center of return strokes during the flash. The infrasound location of the pulses is determined using a network of acoustic arrays. The charge centers are determined using the analytic solutions with slow antenna data from the Langmuir Electric Field Array. More than 50 signature infrasound pulses from over 200 lightning flashes were observed at different times of thunder signals recorded in the Magdalena mountains of central New Mexico during the summers of 2011 and 2012. These observations agree in part with the theory.