

## **Characteristic of Narrow Bipolar Events from Broadband Interferometric and Electric Field Observations**

William Rison (rison@nmt.edu), Mike Stock, Jeff Lapierre, Paul Krehbiel,  
Ron Thomas, Harald Edens and Richard Sonnenfeld  
Langmuir Laboratory for Atmospheric Research  
New Mexico Institute of Mining and Technology  
Socorro, New Mexico 87801

On the afternoon of 5 August 2013, small thunderstorms near Langmuir Laboratory in central New Mexico produced several energetic Narrow Bipolar Events (NBEs) which were a few kilometers from the New Mexico Tech broadband digital interferometer and several slow antennas. Using broadband interferometric data together with data from the Langmuir Laboratory Lightning Mapping Array (LMA), we can resolve the NBEs with a three-dimensional spatial accuracy of a few tens of meters on a microsecond time scale. The angular resolution of the interferometer is sufficient to resolve vertical propagation within the NBEs. Three slow antennas show static field changes produced by the NBEs, from which we can calculate the charge transfers during these events.

All of the NBEs were the first RF-emitting sources of otherwise normal intracloud (IC) flashes. The NBEs occurred in the strong field region between the midlevel negative and upper positive charge regions of the thunderstorms. We will discuss the sizes, propagation velocities, and charge transfers in these NBEs.