

Radio Afterglows from Fireballs

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Abstract

We present the discovery of meteor trail radio afterglows with the First Station of the Long Wavelength Array (LWA1), a 10 to 88 MHz radio telescope located in central New Mexico. Using the all-sky imaging capabilities of the LWA1 we have detected over 100 transient events below 60 MHz. The majority of these events are thought to be emitted afterglows from the plasma trails left by large meteors, a phenomenon distinct from well understood meteor trail reflections. The afterglows are observed to have a smooth and continuous spectra between 20 and 50 MHz, but the spectra is thought to extend well beyond the observational limits of the LWA1. The spectra fit a frequency dependent power law, getting brighter at lower frequencies. My talk will focus on the discovery of the emission, the characterization of the spectra, and a hypothesis of emitted Langmuir waves. I will also discuss ongoing research on the optical counterparts and planned multistation radio observations.