

Abstract Submitted
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Beaming Properties of Energetic Electrons and Photons Inside Thunderstorms¹ ERIC CRAMER, MICHAEL BRIGGS, Univ of Alabama - Huntsville — It has been well established that thunderstorm environments allow relativistic runaway electron avalanches (RREAs) to develop under the influence of strong electric fields. This process can be seeded by external sources, such as cosmic-ray secondary electrons. The resulting *bremsstrahlung* x-rays and gamma rays that are emitted, propagate through the atmosphere and into space where they are detected by orbiting spacecraft, e.g. NASA Fermi. These high energy radiation blasts are known as Terrestrial Gamma-ray Flashes (TGFs). Using a Monte Carlo particle simulation, we show beaming characteristics of these electrons and photons such as the angular distribution, energy spectra, and the radial distribution from the thunderstorm source to the observation point of orbiting spacecraft. These features are related to the thunderstorm electric field, Earths geomagnetic field, and the potential inside the thundercloud region. Observations of TGFs made by the Gamma-ray Burst Monitor (GBM) will also be discussed, as well as a future multipoint CubeSat mission targeted to measure the beaming geometry of the gamma rays.

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