Abstract Submitted
for the APR15 Meeting of
The American Physical Society

Geant4 Simulation of the Relativistic Runaway Electron Avalanche Process and Terrestrial Gamma ray Flashes S.T. ALNUSSIRAT, Department of Physics, University of Alabama in Huntsville, J.W. WATTS, CSPAR, University of Alabama in Huntsville, G.J. FISHMAN, H.J. CHRISTIAN, Earth Systems Science Center, University of Alabama in Huntsville — Terrestrial Gamma-ray flashes (TGFs) are energetic pulses of photons, which are short and intense, originating in the atmosphere during thunderstorm activity. Despite the variety of observations, understanding the mechanisms that generate TGFs have lagged behind. Two mechanisms have been suggested as a source of the TGFs: (1) The Relativistic Runaway Electron Avalanche (RREA) process with the FeedBack mechanism, and (2) the lightning leader mechanism. Using different Electro-Magnetic (EM) processes and electric fields implemented in Geant4, we have simulated the RREA and Feedback Mechanism. The avalanche rate and photon spectra of different EM processes will be presented and discussed.

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Date submitted: 09 Jan 2015 Electronic form version 1.4