

Observations and Implications of Terrestrial Gamma-Ray Flash Electrons

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Terrestrial gamma-ray flash (TGF) emissions are predicted to be accompanied by energetic electron emissions. These electrons have been suggested to explain several anomalous TGF observations by the RHESSI and BATSE spacecraft. These electrons additionally provide a new window for study of TGFs as they carry additional information about the source through their pitch angle / arrival time distributions and confinement by the geomagnetic field. This information could prove very useful for analysis of TGF source mechanisms.

We present results of simulations of electron and photon emissions and describe the implications of these results for inferences about the TGF source. We also present the results of a search of new data from the SAMPEX satellite for these electrons and describe any possible inferences from these observations. The implications of electron beam observations for source altitude, photon emission directional distribution, and meteorological connections will be discussed.