

Comparisons of RHESSI TGF Measurements with Simulations

R. A. Roussel-Dupré and E. M. D. Symbalisty

Los Alamos National Laboratory, Group EES-2, Mail Stop F665, Los Alamos, NM 87545, 505-667-9228; e-mail: rroussel-dupre@lanl.gov

L.P. Babich, I.M. Kutsyk

Russian Federal Nuclear Center-VNIIEF, Mira street, 37, Sarov, 607190, Russia

The recent measurements of Terrestrial Gamma-Ray Flashes (TGFs) obtained by the Reuvan-Ramaty High Energy Solar Spectroscopic Imager (RHESSI) show impulsive events lasting from 0.2-3.5 ms and spectra that extend from 60 keV to ~ 18 MeV. Approximately 125 events collected over an eight-month period have been analyzed. This measurement rate is approximately ten times that compiled by the CGRO BATSE experiment. One important feature of the measured spectra is that no roll off is observed at the low energy end. This result indicates that the source must persist up to ~30 km altitude. Calculations of the γ -ray emissions corresponding to several of our simulations of high-altitude discharges have been performed. Pulse shapes, angular dependences, and spectral signatures of the simulated TGFs are summarized. Detailed comparisons between the computed spectral shapes and absolute fluxes and the RHESSI results are presented.