RHESSI OBSERVATIONS OF TERRESTRIAL GAMMA-RAY FLASHES

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ABSTRACT

The Reuven Ramaty High-Energy Solar Spectroscopic Imager (RHESSI) satellite is currently producing the largest available database of Terrestrial Gamma-ray Flashes (TGFs). The flashes last from 0.2 to 3.5 milliseconds, congregate in regions known to have a lot of lightning, and show photon energies up to 20 MeV, indicating bremsstrahlung from very relativistic electrons in the upper atmosphere. I will discuss statistical properties of the whole sample of events, such as correlations (or lack thereof) among spectrum, duration, and luminosity, and between each of these quantities and the environment of the event (day/night, magnetic latitude, inland, coastal, or over ocean, etc.). A population of softer and fainter events provides tentative, indirect evidence of beaming of the flashes -- in which case the true rate of the events could be much higher than the 50/day over the Earth that we deduce from RHESSI\'s detection rate of about 15 per month.