



Do all lightning produce TGFs? Approaching this question using data from RHESSI and WWLLN

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It has been suggested that all optical lightning flashes are accompanied by a Terrestrial Gamma-ray Flash (TGF). However, the number of TGFs detected by satellite instrumentation is low compared to the number of optical lightning flashes. This could be due to the intensity being too low when the signal reaches the detector, or limitations in instrumentation. Therefore, there might be a gamma-ray signal every time there is a lightning flash, only that the gamma signal drowns in the background noise. We have used the World Wide Lightning Location Network (WWLLN) to acquire lightning data, along with the Reuven Ramaty High Energy Solar Spectroscopy (RHESSI) satellite. We used WWLLN data for the year 2012, and extracted the lightning occurring inside of RHESSI's field of view, resulting in around 1.5 million lightning data. Using the gamma-ray detector on RHESSI, the gamma-ray data will be superimposed to see if there is a significant increase in gamma-rays from the total background. The superposition of data will also occur under various conditions such as inside certain latitudes, the size of RHESSI's footprint, the lightning energy and so on.