

## Recent results from the new RHESSI TGFs

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We have developed a new search algorithm for identifying Terrestrial Gamma ray Flashes (TGFs) in the Reuven Ramaty High Energy Solar Spectroscopic Imager (RHESSI) data. The algorithm has been applied to data from the period 2004–2006 and we have found twice as many TGFs as previously reported. The new TGFs follow the same geographical and seasonal variations as the previously reported TGFs. The match percentage between TGFs and sferics from the World Wide Lightning Location Network (WWLLN) data is comparable for the new TGFs. We are currently applying our algorithm on more recent years, and will present our latest results.

### 1. Introduction

Terrestrial Gamma rays Flashes (TGFs) have been observed by the Reuven Ramaty High Energy Solar Spectroscopic Imager (RHESSI) since 2002 [1]. The catalog of RHESSI TGFs is presented by Grefenstette et al. [2]. In addition they showed the results from an alternative search algorithm. The numbers and quality of these new events were not quantified, but clearly indicates that there are more TGFs than presented in the catalog.

### 2. A new search algorithm

We [3] have developed a new search algorithm which has lowered the RHESSI sensitivity threshold. For the period of 2004–2006 and we have found more than twice as many TGFs as previously reported. A description of the search algorithm can be found in [3].

Figure 1 shows the new TGFs as red circles and the catalog TGFs as green dots. The grey scale is lightning activity measured by LIS/OTD. The maps are divided into seasons. The TGFs we have found follow the seasonal variation in lightning activity. For example during the northern hemisphere winter we have found only one TGF over the Caribbean while the vast majority of TGF observations in the Caribbean occur during northern hemisphere summer and fall. A similar variation is also found in the lightning activity [4].

We have searched for matches between the new RHESSI TGFs and WWLLN events as described in [5]. The result is that the match percentage between TGFs and sferics from the World Wide Lightning Location Network (WWLLN) data is comparable for the new TGFs. This indicates that WWLLN is just

as sensitive to the source lightning for new TGFs as the catalog TGFs.

### 3 Conclusions

We have developed a new search algorithm which have found more than twice as many TGFs as previously reported. These TGFs follows the seasonal variation in lightning activity. The most recent results from our search will be presented.

### 4. References

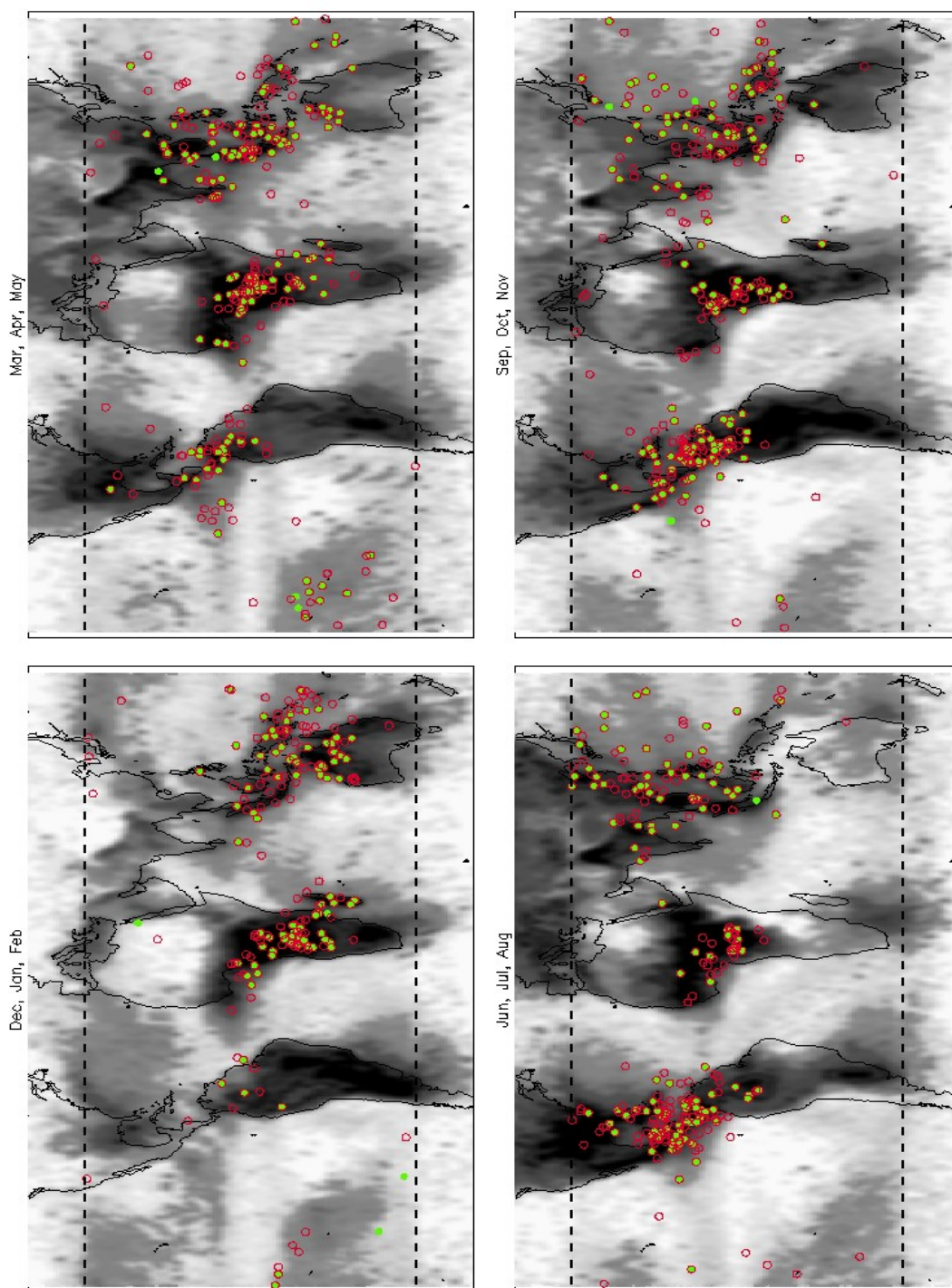
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**Figure 2** RHESSI TGFs for the years 2004, 2005 and 2006. The red circles are TGFs found with the new search algorithm and green dots are TGFs from the RHESSI TGF catalog. There are no TGFs in most of South America since RHESSI does not provide data

for this region (SAMA). The grey scale indicates lightning activity measured by LIS/OTD. The dashed lines are the limits of the RHESSI 38° inclination orbit.