Geophysical Research Abstracts
Vol. 21, EGU2019-8518, 2019
EGU General Assembly 2019

The 3rd AGILE TGF catalog: simultaneous lightning associations

Anders Lindanger (1), Martino Marisaldi (1), Carolina Maiorana (1), Nikolai Østgaard (1), Alessandro Ursi (2), and Marco Tavani (2)

(1) University in Bergen, Department of Physics and Technology, Bergen, Norway (anders.lindanger@uib.no), (2) INAF-IAPS, Rome, Italy

The 3rd AGILE TGF catalog: simultaneous lightning associations

Terrestrial Gamma-ray Flashes (TGFs) are short bursts of high energy photons associated with lightning flashes produced in thunderstorms. The Italian AGILE satellite is one of few satellites capable of detecting these events.

It is possible to find TGF candidates using only time correlation between gamma-ray measurements by AGILE and lightning detected by the World Wide Lightning Location Network (WWLLN). This method is not biased by selection criteria based on gamma-ray data, e.g. spectral hardness ratio, and can therefore identify new candidates which have been overlooked before. Similar procedures have already been successfully applied to data from the Fermi and RHESSI satellites. The ultimate goal is to contribute to answering the question: how common are TGFs?

Using four different datasets collected by the Mini-Calorimeter (MCAL) instrument onboard AGILE, a list of new lightning-associated TGF candidates has been obtained. The four MCAL datasets span from 2009 to 2018 and are differentiated on absolute timing accuracy and TGF detection efficiency.

Here we present the global characteristics of this WWLLN-identified TGF sample. The sample confirms the findings by Connaughton et al. (2013) that TGFs associated with WWLLN have short duration, compared with those TGFs without a WWLLN detection. Several multipeak TGFs are also identified, and in agreement with Mezentsev et al. (2016) the last TGF peak occurs simultaneously with the WWLLN detection. This list of events constitutes part of the 3rd AGILE TGF catalog, soon to be released.