



Observation of TGFs at High Latitude

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Terrestrial Gamma-ray Flashes (TGFs) are short bursts of gamma radiation originating from thunderclouds; they propagate upwards and are then detected by satellites such as AGILE, Fermi and ASIM. ASIM is the first mission specifically designed for the study of thunderstorm-related phenomena (Neubert et al., 2019); being placed on the ISS, it can for the first time detect TGF events up to more than 51 degrees in latitude.

Among the previous missions, RHESSI was the one reaching the highest latitude: 38 degrees. We then consider “high-latitude” for ASIM the band between 35 and 51 degrees of latitude. 9 events have already been observed in this band, inside four distinct geographical regions. At such latitudes, TGFs are expected to experience greater absorption in the troposphere, which makes them more difficult to detect. Moreover, we expect an intrinsically lower production rate due to the lower lightning activity (Smith et al., 2010, Williams et al., 2006).

In this work we present the characteristics of those events, in the context of the global ASIM sample collected so far. We also examine whether the observed number of events is statistically compatible with the atmospheric absorption, taking into account the local flash activity and ASIM’s exposure at high latitude.