

EGU21-2540

<https://doi.org/10.5194/egusphere-egu21-2540>

EGU General Assembly 2021

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Observation of TGFs at Mid Latitude

Carolina Maiorana¹, Martino Marisaldi^{1,2}, Martin Füllekrug³, Serge Soula⁴, Jeff Lapierre⁵, Andrey Mezentsev¹, Chris Alexander Skeie¹, Matthias Heumesser⁶, Olivier Chanrion⁶, Nikolai Østgaard¹, Torsten Neubert⁶, and Victor Reglero⁷

¹University of Bergen, Institute for Physics and Technology, Birkeland Centre for Space Science, Bergen, Norway
(carolina.maiorana@uib.no)

²National Institute of Astrophysics, Bologna, Italy

³University of Bath, Bath, UK

⁴Laboratory of Aerology, University of Toulouse/CNRS, Toulouse, France

⁵Earth Networks, Germantown, MD, USA

⁶Technical University of Denmark, Lyngby, Denmark

⁷University of Valencia, Valencia, Spain

We present a sample of Terrestrial Gamma-ray Flashes (TGFs) observed at mid latitudes by the Atmosphere Space Interaction Monitor (ASIM). The events were detected over the period June 2018 - August 2020 in the latitude bands between 35° and 51° and between -35° and -51°; the sample includes the first observations above $\pm 38^\circ$. The characteristics of these mid-latitude events are consistent with the global population concerning the number of counts, but durations are significantly shorter. We also analyze the meteorological context and the general evolution of the parent storms and we show that the storms are not extreme in terms of total duration and extension. Finally, we present an estimation of the TGF occurrence rate at mid latitudes, based on ASIM's exposure, the local flash rate and tropopause altitude, and we show that it is outside but very close to two standard deviation from the rate of production at tropical latitudes, corrected by the higher atmospheric absorption of higher latitudes. This means that atmospheric absorption plays a major role in the detection of TGFs at mid latitudes, but we cannot rule out other factors.