Geophysical Research Abstracts
Vol. 12, EGU2010-10329, 2010
EGU General Assembly 2010

The angular distribution of Terrestrial Gamma ray Flashes (TGFs) measurements.

Thomas Gjesteland (1), Nikolai Østgaard (1), Morris B. Cohen (2), and Nikolai G. Lehtinen (2)

(1) Department of physics and technology, University of Bergen, Norway, (thomas.gjesteland@uib.no) , (2) STAR Laboratory, Stanford University, Stanford, CA, USA

TGFs are short ($\sim$1 ms) energetic (E up to 40 MeV) bremsstrahlung from electrons accelerated in electric fields that are related to lightning. TGFs are only observed by satellite born detectors. We are using a Monte Carlo model of x-ray propagating through the atmosphere to predict the angular distribution of TGF measurements at satellite altitudes. This distribution is effected by the beaming of the TGF, i.e. the broadness of the production cone. It is also effected by the total initial energy distribution of TGF. Our simulations are compared to 37 RHESSI TGFs, where the observation angle with respect to RHESSI nadir are found by geolocation of VLF spherics. We found that the half angle of the production cone of TGFs are within $\sim$30 deg. This initial production cone is consistent with results from simulations of relativistic bremsstrahlung in vertically uniform quasi static electric fields.