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Monte Carlo simulation of Terrestrial Gamma ray Flashes production altitude

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The physics behind the Terrestrial Gamma ray Flashes (TGF) production is not yet determined. In order to find the physical mechanics that produce these powerful gamma ray flashes we need to find the height of the main production of TGF in the atmosphere. The Monte Carlo simulation use a power law start spectrum and includes effects of photoelectric absorption, Compton scattering and pair production to simulate the gamma ray propagation through the atmosphere. Comparisson between measurements from the satellite based instruments BATSE and RHESSI, and the results from the Monte Carlo simulation gives that TGF seemed to be produced at all altitudes from 15 km to above 60 km . The time delay between high energy and low energy gamma rays measured by BATSE is also reproduced in the Monte Carlo simulation. The time delay can be explained by the Compton scattering effect as suggested by *Dwyer et. al. 2005*. The Monte Carlo simulation model show that one need more measurements in the low energy (< 50 keV) range to verify the production altitude. The ASIM mission, which is planned for the International Space Station (ISS), includes a X- and gamma-ray detector designed to give the measurements in the low energy range of X- and gamma- rays in order to solve this question.