



In-flight measurements of Terrestrial Gamma-Rays

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Thunderstorms emit bursts of energetic radiation. Moreover, lightning stepped leader produces X-ray pulses. The phenomena, their interrelation and impact on Earth's atmosphere and near space are not fully understood yet. In-flight Lightning Strike Damage Assessment System ILDAS is developed in a EU FP6 project (<http://ildas.nlr.nl/>) to provide information on threat that lightning poses to aircraft. It consists of 2 E-field sensors, and a varying number of H-field sensors. It has recently been modified to include two LaBr3 scintillation detectors. The scintillation detectors are sensitive to x- and gamma-rays above 30 keV. The entire system is installed on A-350 aircraft and digitizes data with 100 MSamples/sec rate when triggered by lightning. A continuously monitoring channel counts the number of occurrences that the X-ray signal exceeds a set of trigger levels. In the beginning of 2014 the aircraft flies through thunderstorm cells collecting the data from the sensors. The X-rays generated by the lightning flash are measured in synchronization with the lightning current information during a period of 1 second around the strike. The continuous channel stores x-ray information with less time and amplitude resolution during the whole flight. That would allow x-rays from TGFs and continuous gamma-ray glow of thundercloud outside that 1 s time window.

We will give an overview of the ILDAS system and show that the X-ray detection works as intended. The availability of the lightning associated data depends on the flight schedule. If available, these data will be discussed at the conference.