



On high-energy radiation inside aircraft in thunderstorm environment.

Chris Alexander Skeie (1), Pavlo Kochkin (1), A.P.J. (Lex) van Deursen (2), Nikolai Østgaard (1), Alte I. de Boer (3), Michiel Bardet (3), Cedric Allasia (4), Jean-Francois Boissin (4), and Franck Flourens (4)

(1) University of Bergen, Institute of Physics and Technology, The Birkeland Centre for Space Science, Norway (casskeie@hotmail.com), (2) Eindhoven University of Technology, Eindhoven, Netherlands, (3) National Aerospace Laboratory NLR, Amsterdam, Netherlands, (4) Airbus Defence and Space, Toulouse, France

In thunderstorm environment aircraft experience different types of radiation during a lightning flash. With sophisticated lightning detection equipment (ILDAS) on board Airbus test aircraft we have identified four distinct types of high-energy emissions that can penetrate through the aircraft fuselage. They are as follows:

1. Nanosecond long x-ray pulses during initiation of negative stepped aircraft-triggered leaders.
2. Microsecond long x-ray bursts from the recoil processes during lightning flashes.
3. Second long positron annihilation signatures from static discharges.
4. Minute long gamma-ray glows from thunderclouds.

In this presentation we will discuss these phenomena and give examples of their appearances. They will be compared to ground and laboratory measurements.