

Development of Instrumentation to Study High-Energy Radiation from Lightning Aboard Airborne Platforms

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UC Santa Cruz is looking to develop two types of radiation detection systems that can be used aboard aircraft, sounding balloons, dropsondes, and UAVs (Unmanned Aerial Vehicles) to study radiation from Terrestrial Gamma-ray Flashes (TGFs), longer-lived gamma-ray glows, x-rays from lightning stepped leaders, and possible high-energy radiation, never yet observed, from blue jets, gigantic jets, and blue starters.

Our focus will be on developing two types of instruments:

Small and inexpensive CCD radiation detectors (~1 kg) that will fit inside the standard dropsonde and mini-dropsonde envelope used by NCAR's AVAPS-II (Airborne Vertical Atmospheric Profiling System) and can be used with sounding balloons.

A mid-size detector system (~10 kg) based on UCSC's ADELE (Atmospheric Detection of Energetic Lightning Emissions) instrumentation, suited for aircraft like NOAA's P-3 Orions that can fly into severe storms over the Atlantic, Caribbean, Gulf of Mexico and the Eastern Pacific.