**An Electron Microburst detector for the RADICALS Space Mission**

Caleb Guthrie, Jack Zheng, Jonathan Gan, Bo Yu, Anant Telikicherla, Henry Tiedje, Louis Ozeke, Leon Olifer, Robert Fedosejevs and Ian Mann

The RADICALS Space mission will consist of a satellite with a suite of detectors designed to study the effects of incoming space radiation on the atmosphere where one of the goals is to measure the flux of precipitating electrons entering the upper atmosphere. This quantitative data will allow better modeling of the physical processes that couple the magnetosphere, ionosphere, and atmosphere, including the creation and destruction of NOx and HOx. An important component of the incident electron flux results from high flux microbursts of electrons generated by wave particle interactions in the magnetosphere. A fast time response electron detector is being designed to measure such microburst events.

This microburst detector will incorporate a scintillator coupled to a silicon photomultiplier (SiPM). The detector is expected to be able to measure electrons with energy of ~200 keV up to ~3 MeV. In order to handle the large variation in particle arrival rates over this large energy band, the detector is split into two heads for the low (<800 keV) and high (>800 keV) energy bands. The detector heads are designed to handle bursts of up to 200,000 counts per second at a measurement cadence of 10 ms and will have geometric factors on the order of 2 $cm^2$ sr and 10 $cm^2$ sr respectively. In order to provide adequate thermal and radiation shielding for the SiPM elements, a light guide will couple the scintillator to the SiPM detector, recessed within the spacecraft structure.

We will present the most recent designs of the detector elements and results of characterization tests conducted using radioisotope and laser-plasma electron sources.