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REMOTE SPECTRAL IMAGING USING A LOW COST UAV SYSTEM

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Abstract. The purpose of this scientific survey is to support the research being conducted at York University in the field of spectroscopy and nanosatellites using Argus 1000 micro-spectrometer and low cost unmanned aerial vehicle (UAV) system.

On the CanX-2 mission, the Argus spectrometer observes reflected infrared solar radiation emitted by Earth surface targets as small as 1.5 km within the 0.9-1.7 μm range. However, limitations in the volume of data due to onboard power constraints and a lack of an onboard camera system make it very difficult to verify these objectives using ground truth. In the last five years that Argus has been in operation, we have made over 200 observations over a series of land and ocean targets.

We have recently examined algorithms to improve the geolocation accuracy of the spectrometer payload and began to conduct an analysis of soil health content using Argus spectral data. A field campaign is used to obtain data to assess geolocation accuracy using coastline crossing detection and to obtain airborne bare soil spectra in ground truth form. The payload system used for the field campaign consists of an Argus spectrometer, optical camera, GPS, and attitude sensors, integrated into a low-cost, unmanned aerial vehicle (UAV), which will be presented along with the experimental procedure and field campaign results.

[Conference paper](#) (PDF, 1263 KB)

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