

Overview

The algorithm is the first step of the SAWG-OVIRS pipeline. OVIRS calibrated radiance spectra are "resampled" onto a standard sampling such that each channel of the OVIRS spectra will have a fixed position in the wavelength dimension, 2-nm spacing from 0.392 to 2.4 microns and 5-nm spacing from 2.4 - 4.34 microns. This will greatly aid in processing speed during operations, as well as uniform data products from the SAWG. The output product is a spectrum with radiance units of $W/cm^2/\mu m/sr$ per spectral element.

Algorithm Description

Currently, the algorithm computes the resample bin for each collected superpixel, with no weighting, preserving all input signal. The ground testing derived temperature-dependent wavelength calibration file defines the spectral bin center wavelengths and effective bin width. This forms a mapping between detector wavelength and output spectral bin. All the signal ($W/cm^2/sr/\mu m$) from each detector is assigned (added) to the bin with the closest center wavelength. The algorithm keeps track of the number of super pixel samples that are accumulated in each bin and written to the output file to be used in later processing. The overlap between segments is accounted for by accumulating all the signal from the overlapping regions into the closest bin.

In the future, the wavelength calibration file will be updated with inflight data (TVAC spectral characterization was limited by the available spectral sources that could be fed through the chamber window). The data from the Earth flyby will be a chance to work with data with some significant spectral content to validate the wavelength assignment and to make some judgements on the performance of alternate weighing/binning strategies.

Example

This will be applied to every spectrum automatically to produce resampled spectra as the first step of the SAWG-OVIRS automated pipeline. The code is available below, however.

Installation, Program Files, User's Guide, and Test Data

This code is written in IDL. Input is the OVIRS calibrated radiance spot data. Output is a resampled spectrum with no spectral overlap, and following the resampling specified by the science team: resampled at 2-nm spacing from 0.392 to 2.4 microns and 5-nm spacing from 2.4 - 4.34 microns per SAWG discussion about the native resolution of the OVIRS spectra and solar flux model, described in the README file below. The resultant spectra are stored as double precision floating point arrays of 1393 x 3 elements (wavelength, radiance, radiance uncertainty).