

reflectance.py documentation

Script to transform the pixel values (spectral radiance ($\frac{W}{m^2 \times sr \times micron}$)) of all calibrated dawn vir isis cubes in a particular directory into reflectance values through:

$$R(\lambda(b), x, y) = \frac{S(\lambda(b), x, y) \times (\pi \times (ssd/K)^2)}{si}$$

Where:

- $R(\lambda(b), x, y)$ is the reflectance factor of a pixel (x, y) in a given band (b) ;
- $S(\lambda(b), x, y)$ is the calibrated spectral radiance of a pixel (x, y) in a given band (b) ;
- K is the value of one astronomical unit expressed in km (149597870.7)
- ssd is the spacecraft heliocentric distance expressed in km, as read from the cube label file in the *SPACECRAFT_SOLAR_DISTANCE* field;
- si is the solar irradiance for *VIS* and *IR* channels, as read from "dawn_vir_ir_solar_spectrum_v2.tbl"

Parameters

The script will take two parameters as input:

1. "input_dic" must be the path to the directory in which the isis cubes are contained. It will be used to look for the isis cubes that will be transformed and also the label of each cube.
2. "output_dic" the path to where the transformed cubes will be saved

Requisites

- Make sure that you have the packages from the requirements.txt file installed
- Your input directory must contain the label files (.lbl) of each cube

Warning

If you choose your output and input directory to be the same (when this is the case, the script will ask you to confirm that you really want to keep the same path) your "original" cubes will be overwritten, if this is not what you want, make sure to provide a different path to your output.