DART
Automatic camera configuration

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Document Changes

1.1	28/10/2020	Added Table of Contents, figure numeration, Document Changes Table. Small format changes

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1. Introduction

When a new Simulation is created in DART, the cameras are configured with a single band, which corresponds to the green peak in the visible spectrum.

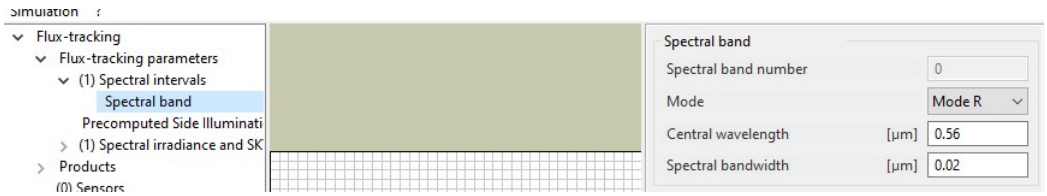

Fig. 1.1: Default spectral band in DART and its corresponding settings.

Setting complex cameras is a slow and repetitive work, and as such, can be automated.

The band_setting.py python script uses a .txt file where sensors are described by their central wavelength and their spectral bandwidth, setting the DART spectral band files to match the sensors. 3 text files are included with the script, showing 3 different types of cameras:

- dart_camera_RGB.txt: simple RGB camera, with 3 spectral bands
- dart_camera_sequoia.txt: Sequoia-like camera, with 5 spectral bands
- dart_camera_sentinel_2.txt: Sentinel-2 camera, with 13 spectral bands

The contents of the file dart_camera_sentinel_2.txt are shown here, as an example of how the file should be. The first column sets the central wavelength of the camera band. The second column, optional and separated by a space, sets the bandwidth of that band. If no there's no second column, the bandwidth will be set to 0.

```
0.443 0.02

0.49 0.065

0.56 0.035

0.665 0.03

0.705 0.015

0.74 0.015

0.783 0.02

0.842 0.115

0.865 0.02

0.945 0.02

1.375 0.03

1.61 0.09

2.190 0.180
```

2. Usage

The script modifies an XML file that stores all the bands of the camera, and their settings. This XML file can be found at Input/phase.xml in the main folder of the simulation.

The script needs 2 parameters to work:

- -f pathToFolder: path to the simulation folder
- -i cameraData.txt: path to the text file with camera settings

It can also use 2 optional parameters:

- -o outputXML: path to the output XML file. When not used, the original XML file is overwritten.
- -d: do not delete old camera settings from the file. If enabled, bands will be added to the file, instead of overwritten.

As such, general execution of the script would be:

```
python band_setting.py -f simulationFolder -i input.txt [-o output.xml -d]
```

And with an example:

```
python band_setting.py –f C:\Users\user\DART\user_data\simulations\testSimulation –i
C:\Users\user\DART\user_data\dart_camera_RGB.txt
```

3. Requirements

Python is required to be installed for the script to work.