Reuniwatt

Excellence in forecasting

Cloud product description for the Sky InSight™

February 25

Global Overview

This document will give:

- a brief description of the cloud product
- Information regarding the data (format and size)
- Information regarding where the data is stored

In the following slides, we will describe the pixel to value conversion method that must be used to retrieve the physical values from the pixel values. To describe the functions, we will use the following terms:

- p: pixel value of the image
- v: physical value

Cloud Products presented in this document

SKIS-CO001 Automated Mask and Geometric Calibration

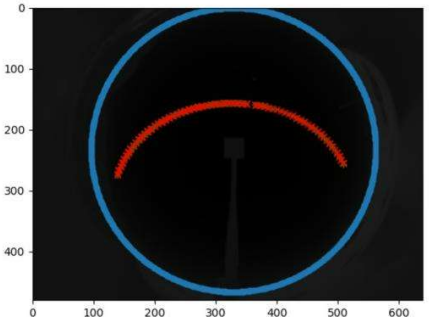
SKIS-CO002 Cloud Cover and Cloud Fraction

SKIS-CO005 Cloud Optical Depth (COD)

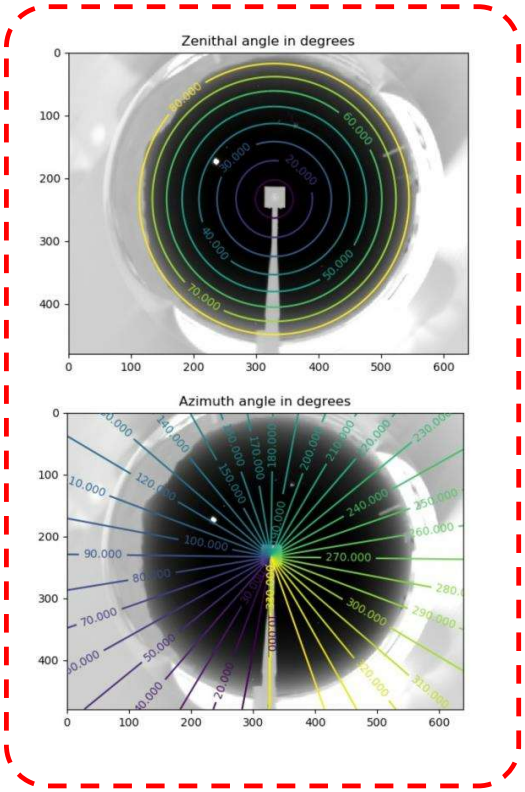
In addition:
Different possible cloud views
Raw images

SKIS-CO001 Automated mask and geometric calibration

Reuniwatt's geometrical calibration



Red dots: sun positions



Azimuth and zenith information per pixel are provided in the jp2 files

Check on the next slide for the pixel value

The files are stored on the Sky InSight™ (and/or the Sky Companion HW001 option), with the following file structure:

```
├── calibration
|   └── YYYYMMDD-HHMM
|   |   └── azimuth.jp2
|   |   └── zenith.jp2
```

Remarks: if the instrument is moved during or after the calibration, please restart the calibration to have a better cloud product quality

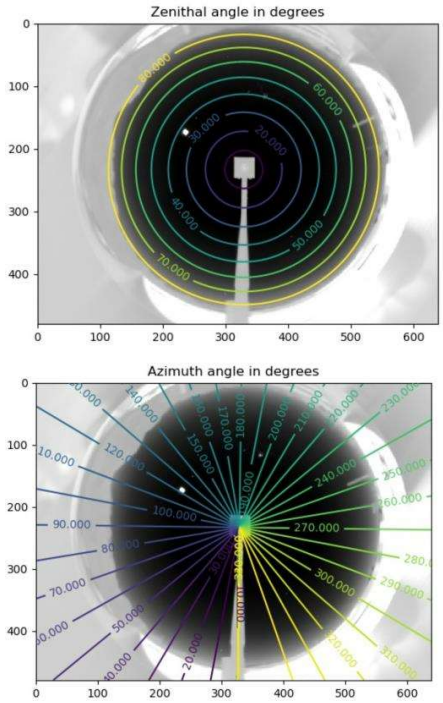
One folder with 2 images after each calibration

SKIS-CO001 Automated mask and geometric calibration

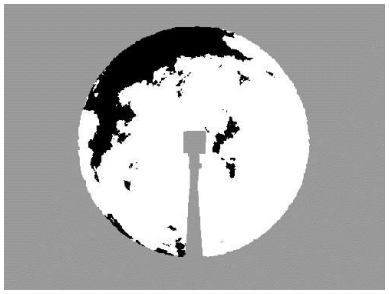
Azimuth table values (°) are stored as a 16-bit JPEG 2000 file with the following pixel to value convention:
$v = p * 360/64000$
p = 65535
v = masked

Azimuth is measured using the East from North convention:
- 0° is North
- 90° is East
- 180° is South
- 270° is West

Zenith table values (°) are stored as a 16-bit JPEG 2000 file with the following pixel to value convention:
$v = p * 90/64000$
p = 65535
v = masked



SKIS-CO002 Cloud Cover and Cloud Fraction



Cloud Cover images (no unit) are stored as 8-bit JPEG 2000 files with the following pixel to value convention:

$p = 0,\ v = \textit{clear sky}$

$p = 155,\ v = \textit{masked}$

$p = 255,\ v = \text{cloudy}$

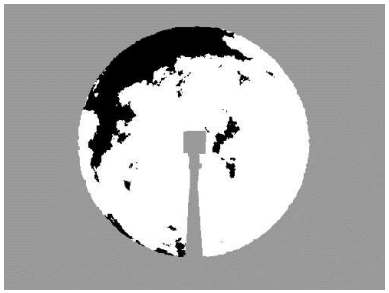
The jp2 files are stored on the Sky InSight™ (and/or the Sky Companion HW001 option) with the following file structure:

```
└── skyimager_postprocessed_images
│   ├── cloud_cover_8bit
│   │   └── 20221222
│   │   │   └── cloud_cover_8bit_20221222000000.jp2
...
│   │   │   └── cloud_cover_8bit_20221222235930.jp2
```

Size ~ 90MB/day

1 image is added every 30s
1 folder per day

SKIS-CO002 Cloud Cover and Cloud Fraction



Cloud fraction is saved using a csv format.

The csv files are stored on the Sky InSight™ (and/or the Sky Companion HW001 option) with the following file structure:

```
├── skyimager_features
│   └── skyimager_features-20221222.csv
```

Size ~ 10Mo/month

1 line is added every 30s
1 file per day

SKIS-CO005 Cloud Optical Depth (COD)

Cloud Optical Depth images (no unit) are stored as 16-bit JPEG 2000 files with the following pixel to value convention:

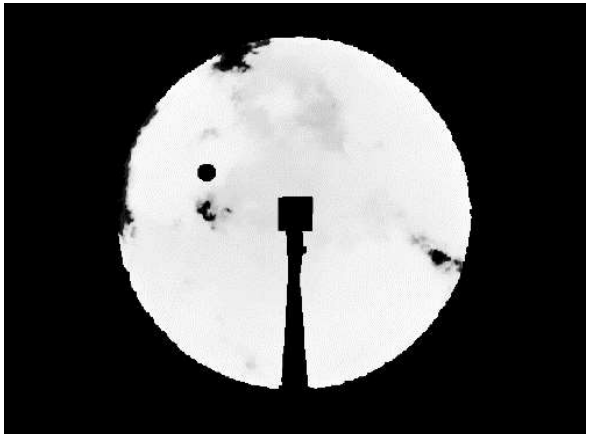
$$v = p * 10/64000$$

$$if\ p = 65535, \text{v = masked}$$

The jp2 files are stored on the Sky InSight™ (and/or the Sky Companion HW001 option) with the following file structure:

```
└── skyimager_postprocessed_images
|   └── COD_16bit
|   |   └── 20221222
|   |   |   └── COD_16bit_20221222000000.jp2
...
|   |   |   └── COD_16bit_20221222235930.jp2
```

Size ~ 110MB/day



1 image is added every 30s
1 folder per day

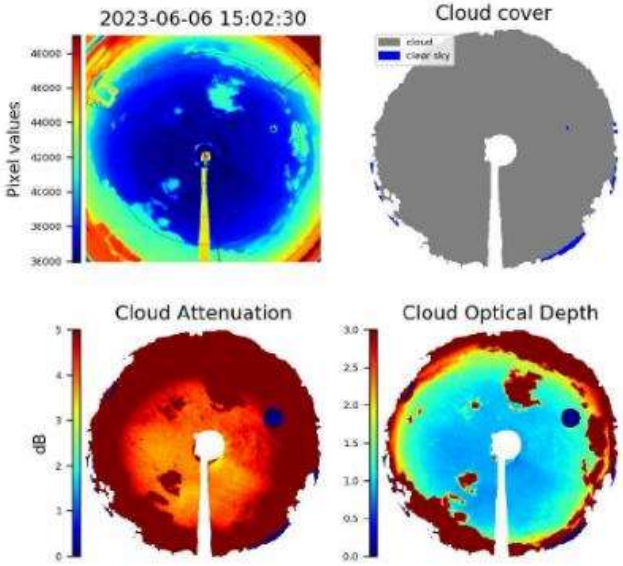
Different possible cloud views

The cloud view provides a variety of information gathered in one image such as the raw image, the cloud cover, the cloud attenuation and the cloud optical depth. The final image depends on the products and options that have been bought by the user.

The jpg files are stored on the Sky InSight™ (and/or the Sky Companion HW001 option) with the following file structure:

```
└── skyimager_postprocessed_images
│   ├── cloudview_adapt
│   │   └── 20221222
│   │   │   └── cloudview_adapt_20221222000000.jpg
...
│   │   │   └── cloudview_adapt_20221222235930.jpg
```

Size ~ 200MB/day



1 image is added every 30s
1 folder per day

Raw images

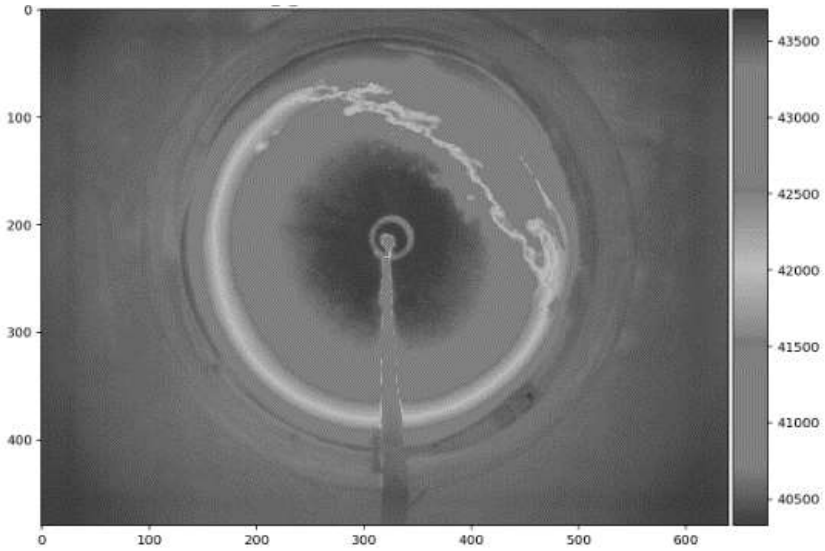
Raw infrared images (no unit) are stored in their native 16-bit JPEG 2000 format.

No conversion is applied ($p = v$).

The jp2 files are stored on the Sky InSight™ (and/or the Sky Companion HW001 option) with following file structure:

```
├── images
│   └── 20221222
│   |   └── 20221222000000.jp2
...
│   |   └── 20221222235930.jp2
```

Size : 1.3GB/day



1 image is taken every 30s
1 folder per day

Notice that false color image are not available on the Sky InSight. They can be generated from the RAW images.