



Cloud properties from spectral and polarized imaging

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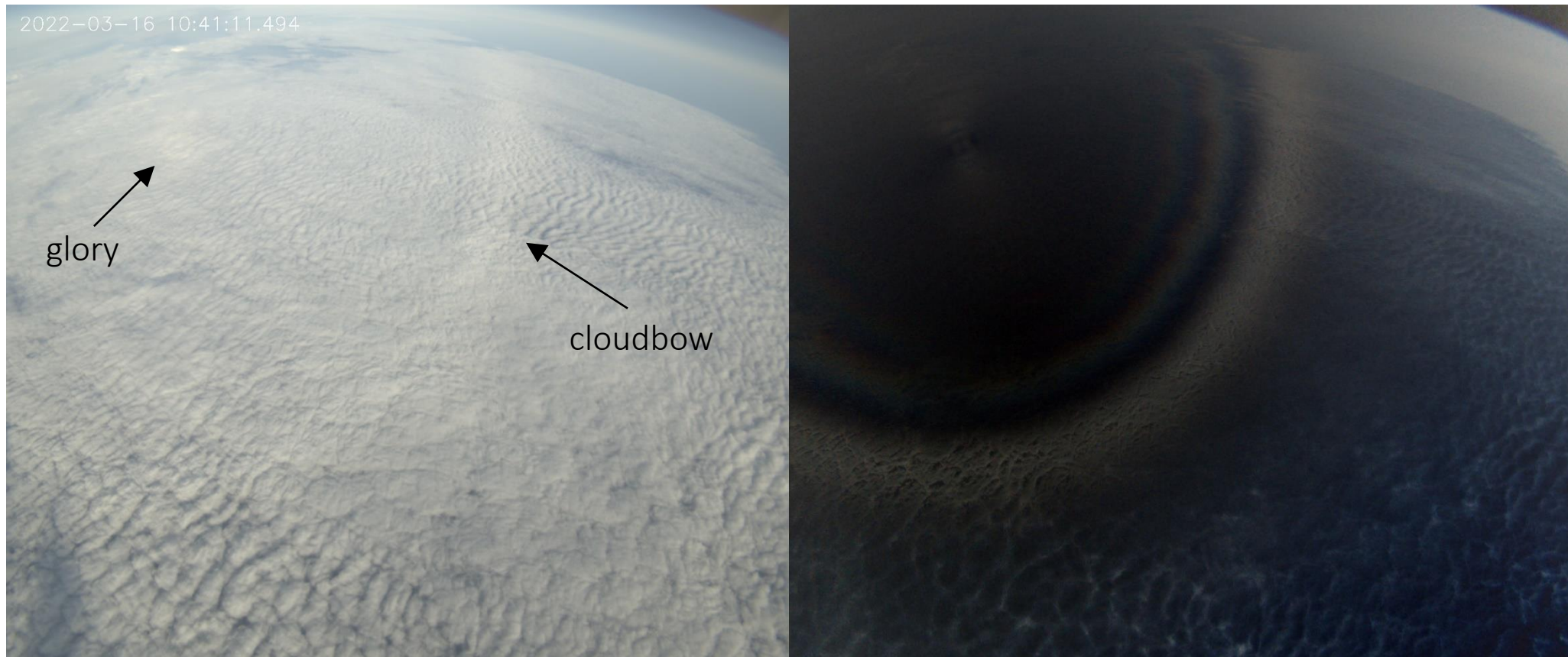
Overview



- **Polarization cameras:** ($82^\circ \times 110^\circ$ max. combined FOV)
 - Cloud geometry from stereography (Kölling et al. 2019)
 - Cloudbow retrieval (effective radius and variance at cloud top)
- **VNIR:** calibrated radiances 400 – 1000 nm (shutter problems ☹)
- **SWIR:**
 - Calibrated radiances 1000 – 2500 nm, 35.5° FOV
 - Cloud mask
 - Bi-spectral retrieval of cloud optical depth and effective radius for water clouds
- In progress or planned in the future:
 - Cloud thermodynamic phase
 - Bi-spectral retrieval for ice clouds
 - Cloud mask for polarized cameras

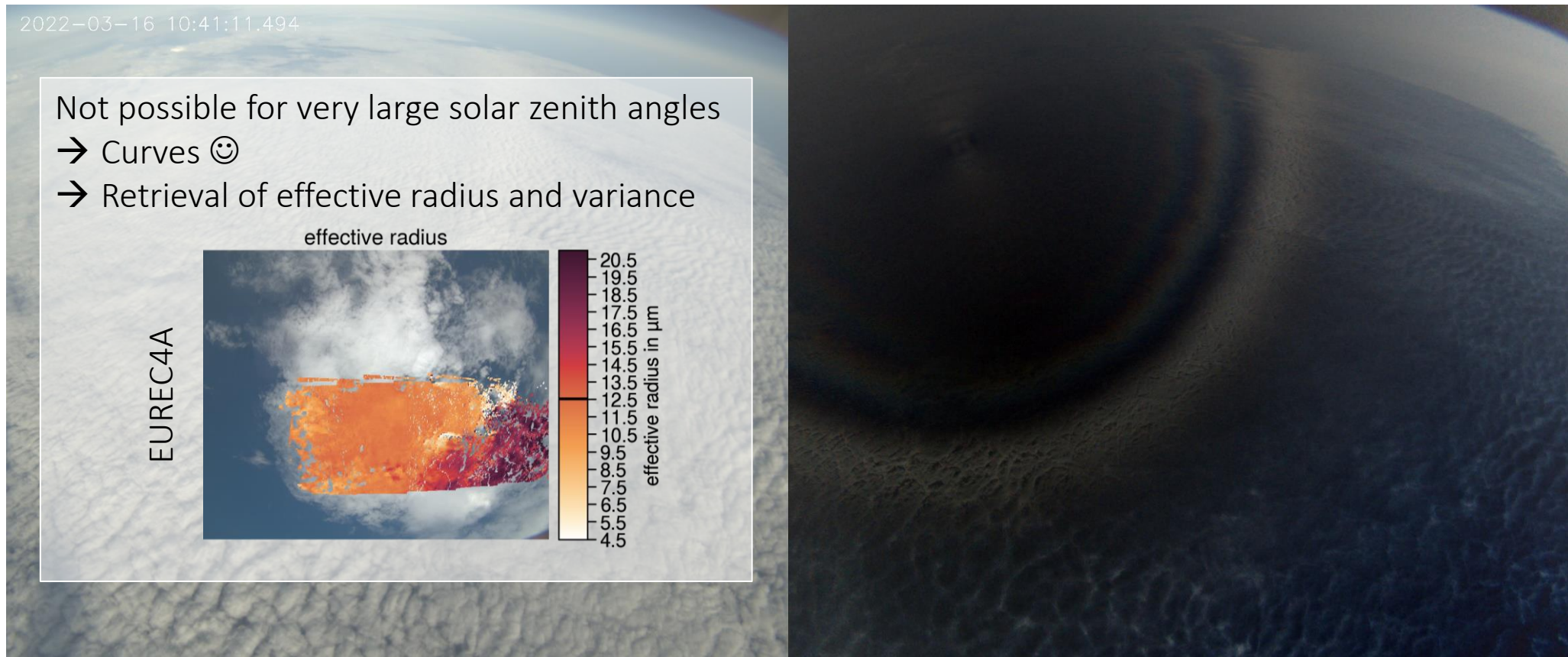
Polarization cameras

<https://macserver.physik.uni-muenchen.de/campaigns/>



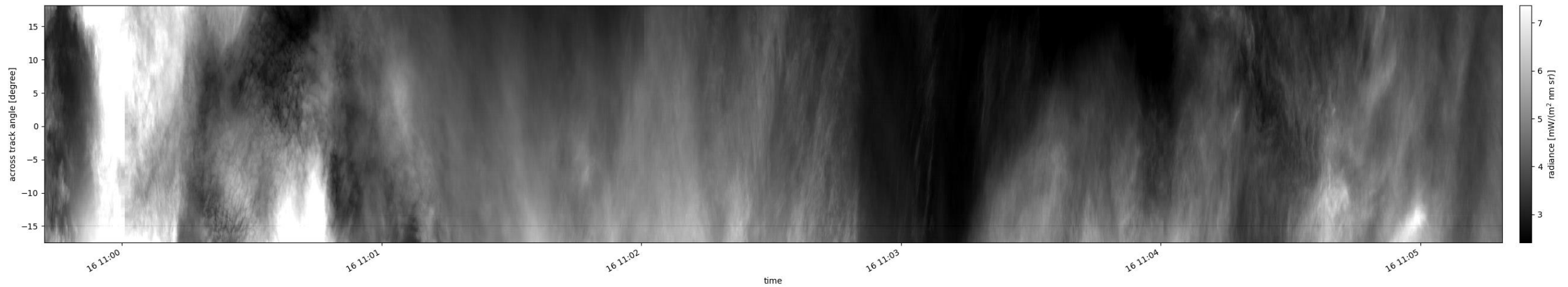
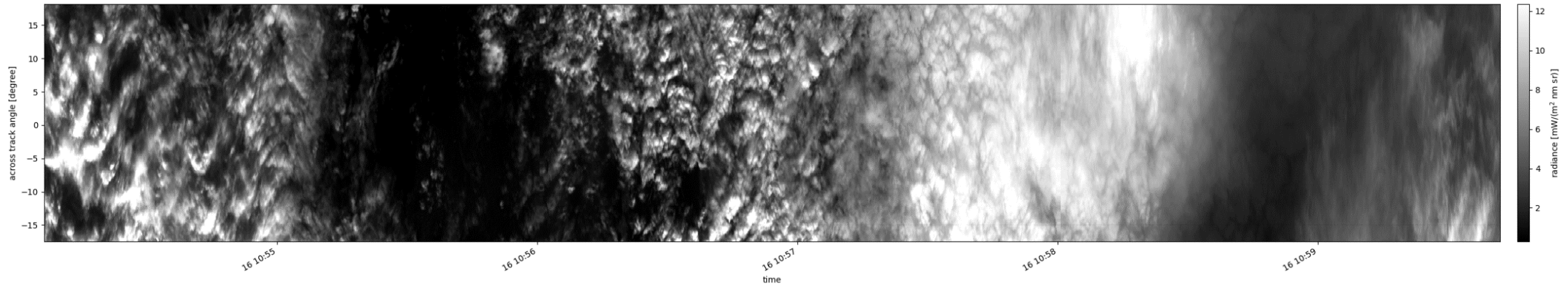
Polarization cameras

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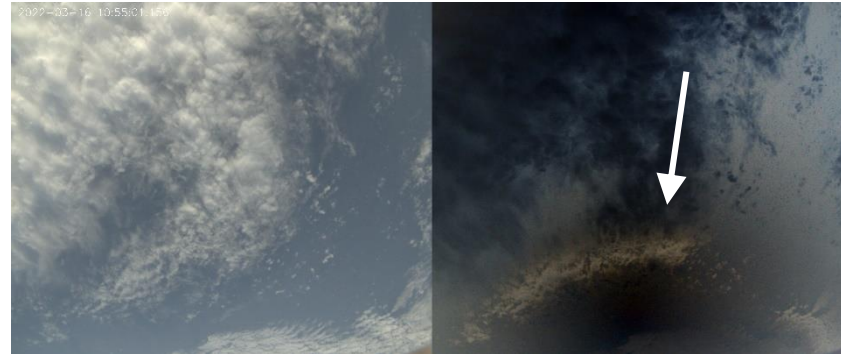
SWIR camera

<https://macserver.physik.uni-muenchen.de/campaigns/>

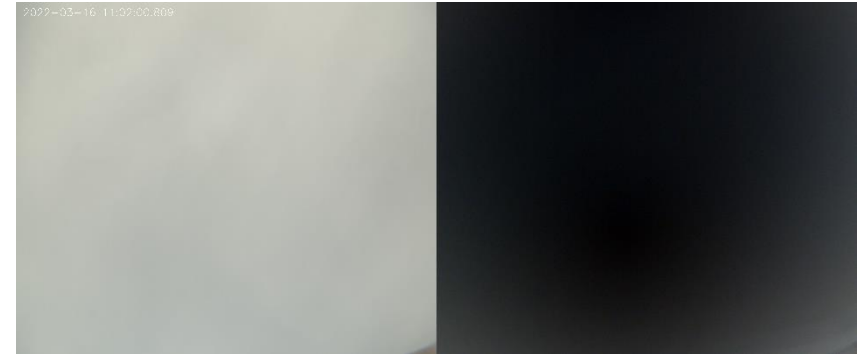


Cloud phase

water (or mixed)



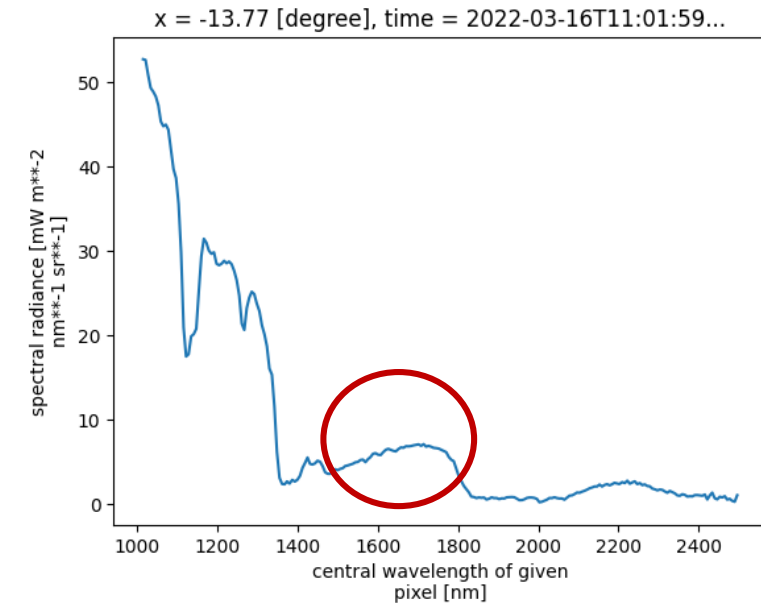
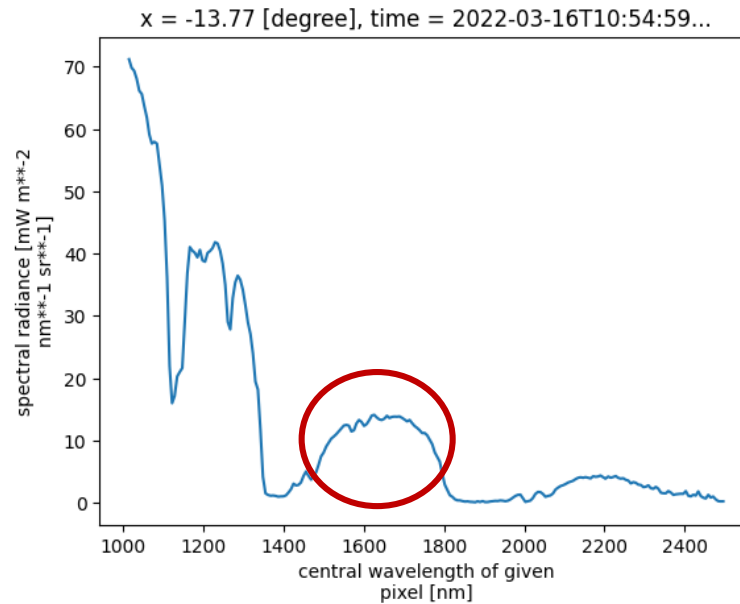
ice



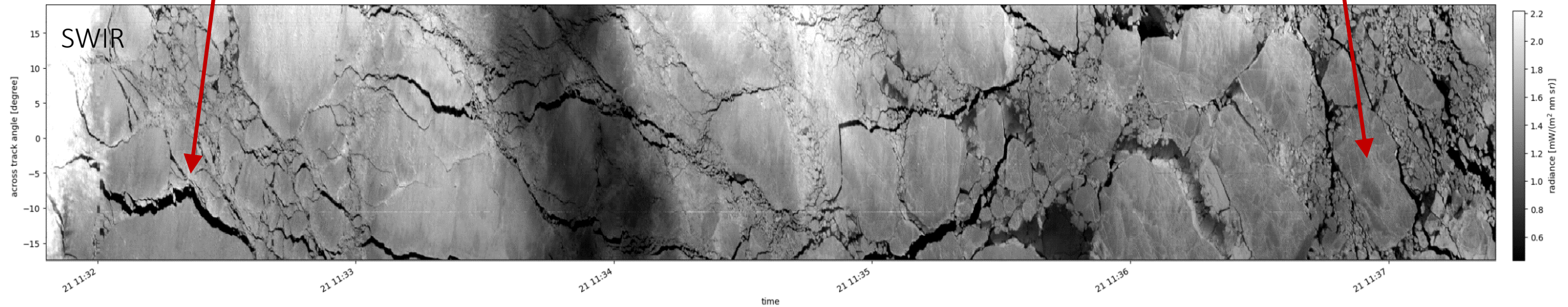
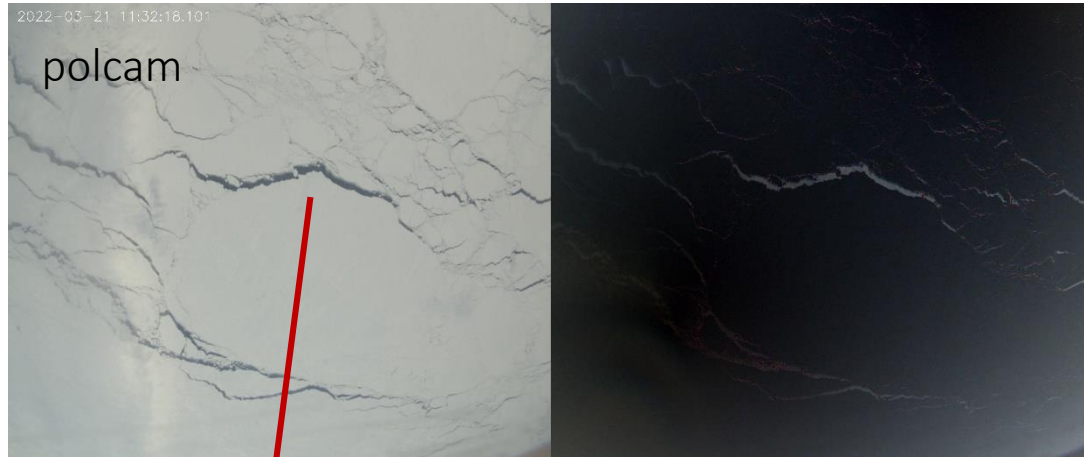
- Polcam:

- SWIR:

(similar to Ehrlich et al. 2008)



Observations of sea ice



Have a look at our movies and quicklooks:



specMACS on (AC)3 campaign (March/April 2022)

summary of research flights

| date | name | report | remarks |
|----------------------------|---------------------------|--------|-------------------|
| 2022-02-21 | HALO-0221 | | • EMI Flight |
| 2022-02-25 | HALO-0225 | | • Test flight |
| 2022-03-11 | HALO-0311 | | • Transfer flight |
| 2022-03-12 | HALO-0312 | | • |
| 2022-03-13 | HALO-0313 | | • |
| 2022-03-14 | HALO-0314 | | • |
| 2022-03-15 | HALO-0315 | | • |
| 2022-03-16 | HALO-0316 | | • |
| 2022-03-20 | HALO-0320 | | • |
| 2022-03-21 | HALO-0321 | | • |

specMACS products

Products derived from the specMACS data captured during (AC)3 campaign can be downloaded [here](#).

the specMACS instrument

specMACS is a hyperspectral imager, capturing one image line at a time. It is sensitive in the range of approx. 400nm to 2500nm and has a field of view of approximately 35°. During (AC)3 it is mounted on the HALO aircraft facing downwards and is accompanied by two 2D polarization resolving cameras.. More information can be found in [Ewald et al. \(2016\)](#).