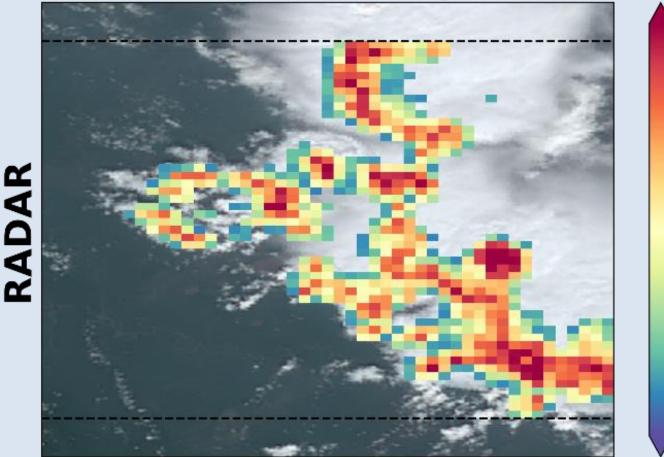


DPR Reflectivity

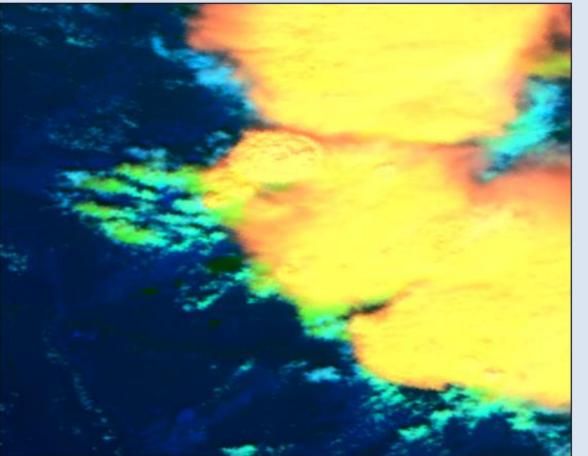


GMI 89 GHz (H)



GLM Flash Extent Density

Cloud Phase RGB



DPR Attenuation Correction

10

275

225

200

175

150

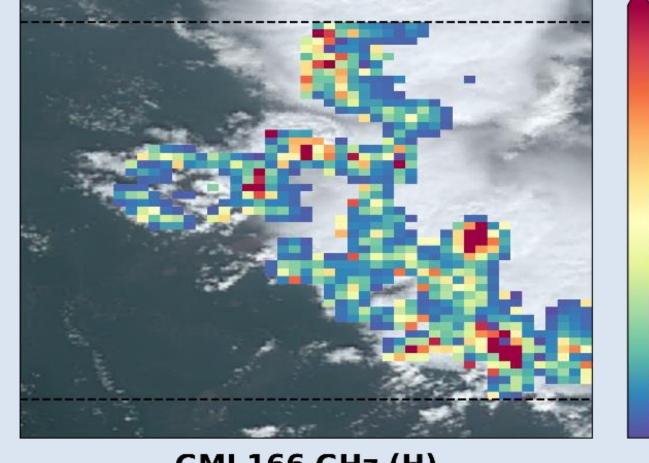
125

100

1000

-200

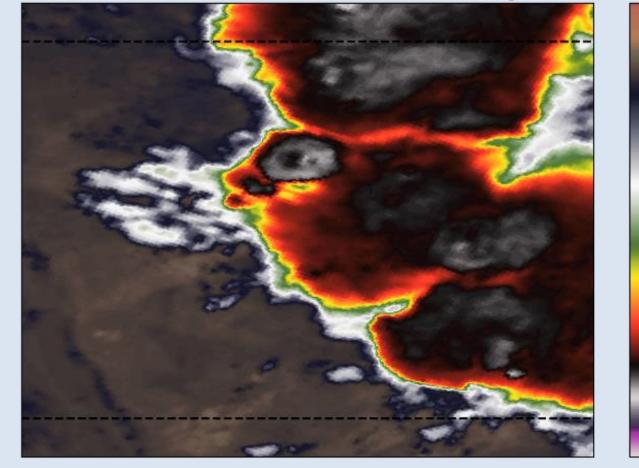
100



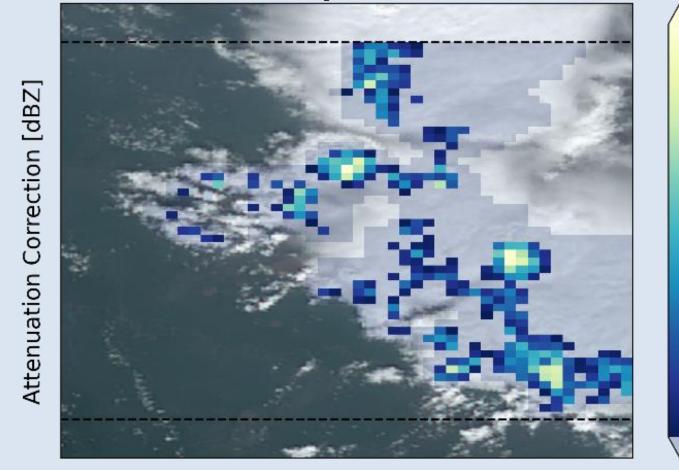
GMI 166 GHz (H)



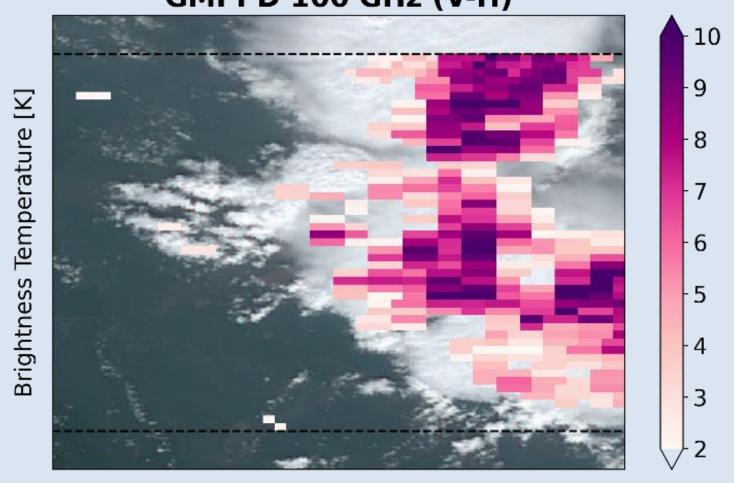
Clean IR Window Band (10.3 µm)



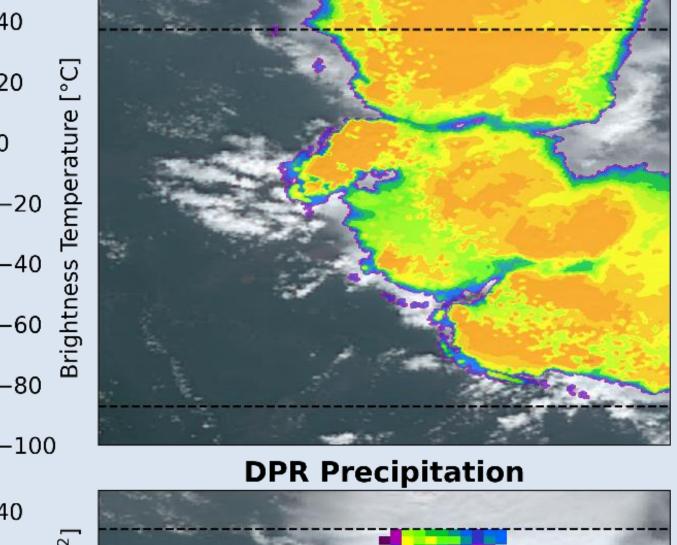
Total Precipitable Water

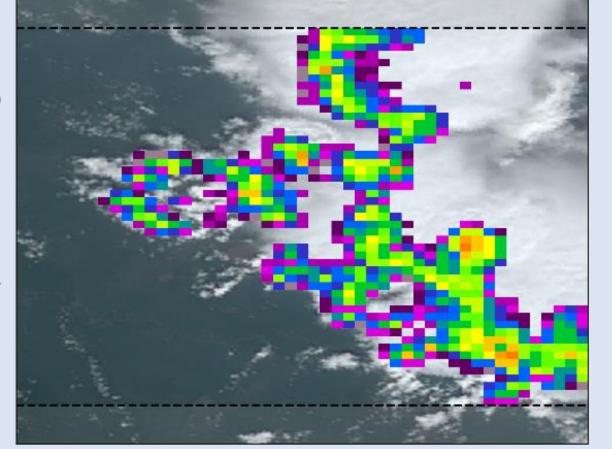


GMI PD 166 GHz (V-H)

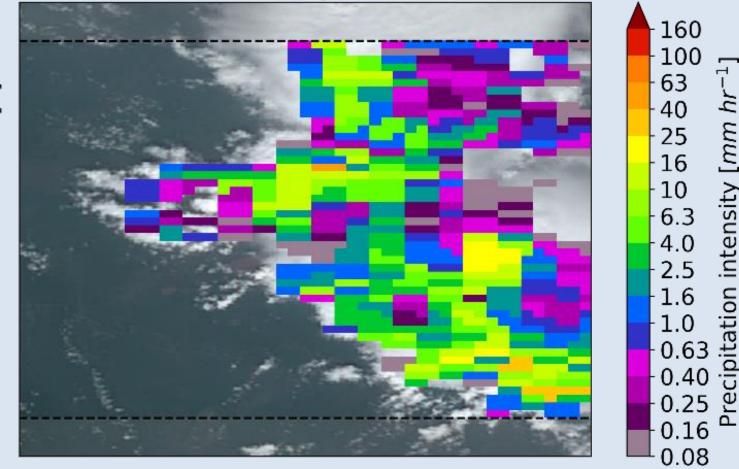


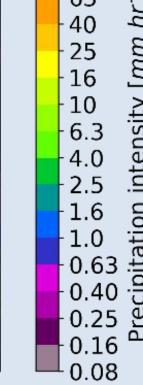
GOES-16 Precipitation





GMI Precipitation





10-4

10⁻⁵ डे

10⁻⁶ ដី

10-7

160

100

0.25

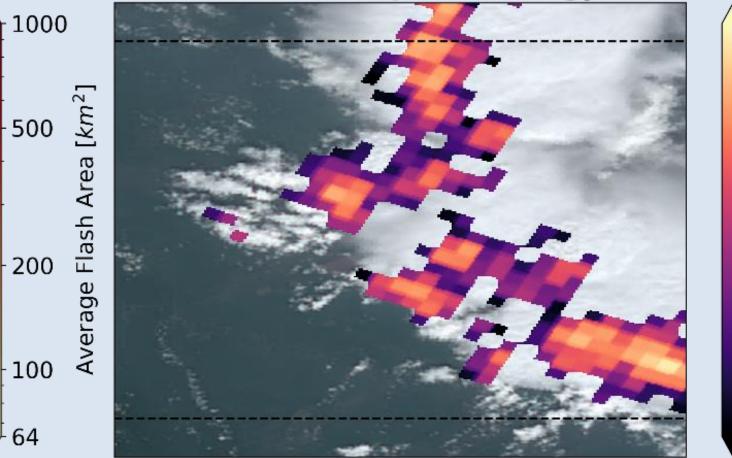
0.16

160

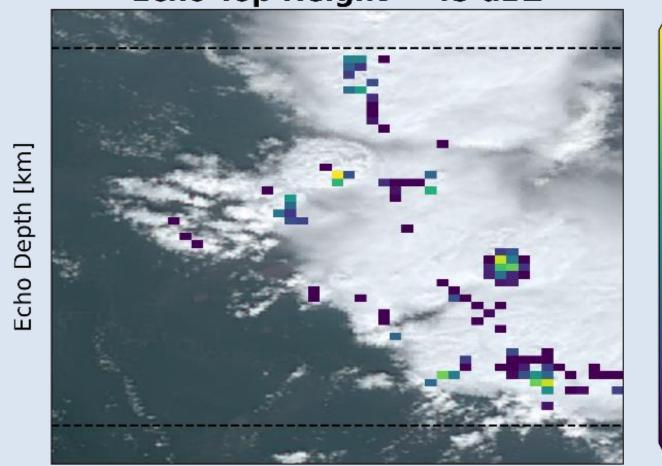
100

0.16

GLM Total Optical Energy







-6.0

-5.5

5.0

4.5

3.0

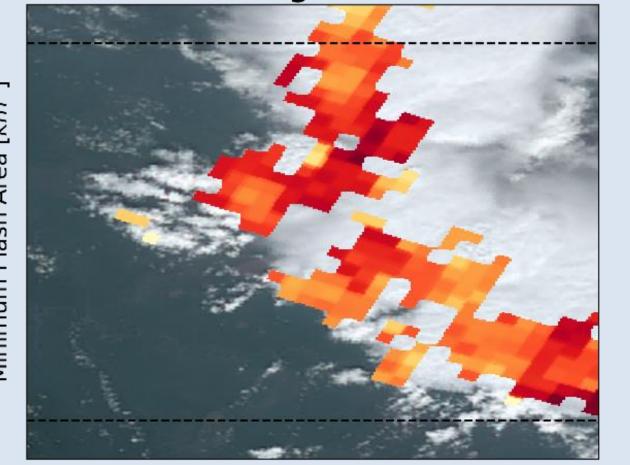
2.5

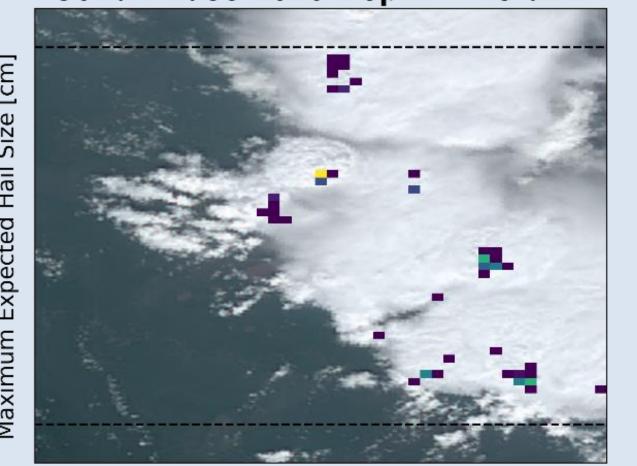
2.0

- 40

20

20





GLM Average Flash Area



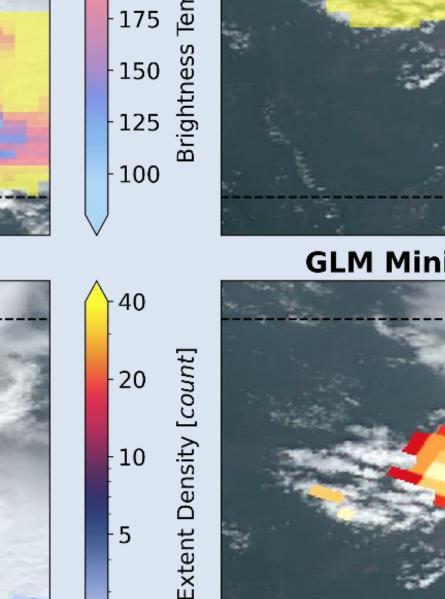




3.0

2.0

1.5



- 50

45

35

· 30

25

20

15

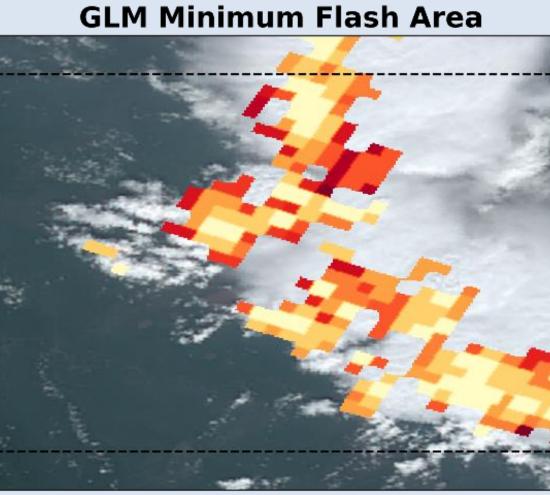
10

275

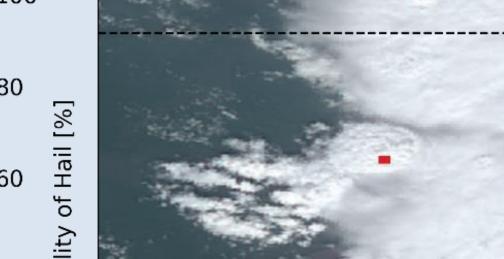
225

200

[dBZ]



MESHS



∢

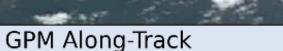


PMV



POH





GPM Along-Track

GPM Along-Track

GPN-GEO

A Multimodal Remote Sensing Archive for Cloud and Precipitation Research

Gionata Ghiggi¹, Alexis Berne¹

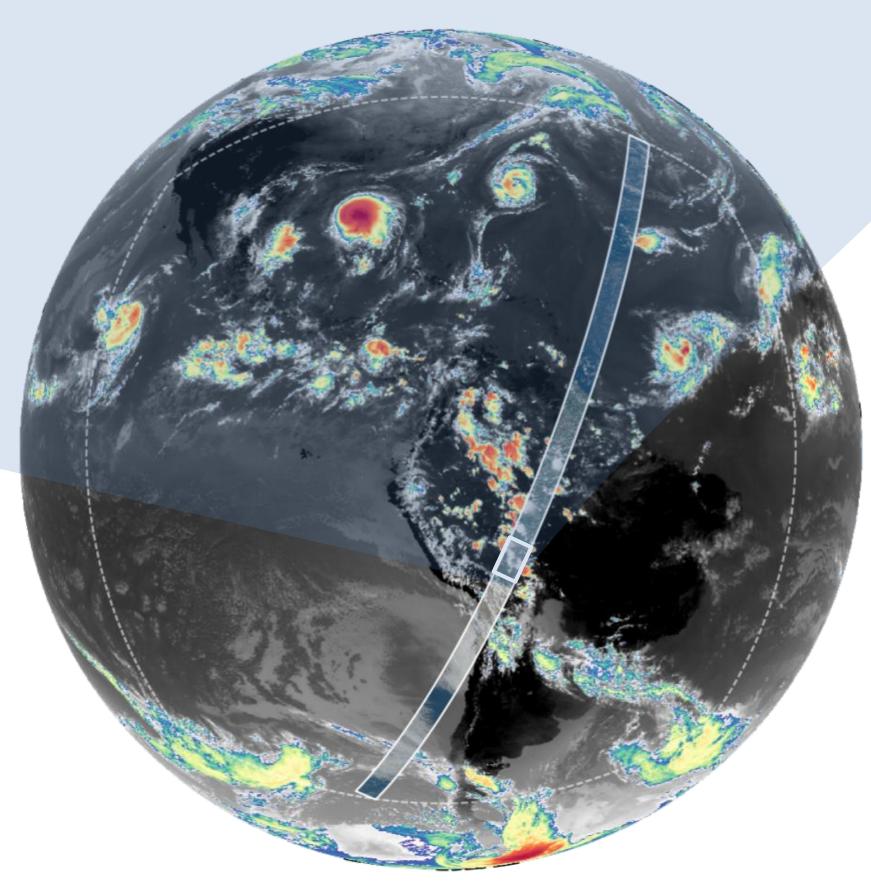
¹Environmental Remote Sensing Laboratory, LTE, EPFL, Lausanne, Switzerland

Motivation

 The Global Precipitation Measurement Mission (GPM) Core Observatory satellite is equipped of

Archive

- Time period: 2019 present
- GEO sensors: GOES-16/17/18 ABI, Himawari-8/9 AHI



a Dual Frequency Precipitation Radar (DPR) and a passive microwave (PMW) imager (GMI).

- GPM DPR provides infrequent but global accurate instantaneous **precipitation** estimates.
- Third-generation geostationary (GEO) visible (VIS) / infrared (IR) imagery and lightening measurements provides high-frequency spatiotemporal **cloud** monitoring capabilities. • **GPM-GEO** is an analysis-ready and cloud-

optimized (ARCO) satellites coincidence archive designed to improve how we identify, monitor and analyze precipitation from space.

• GEO VIS/IR bands: 16 (0.47 – 13.3 μ m)

- GPM PMW channels: 11 (10.65 183±7 GHz)
- GPM DPR frequencies: 13.6 (Ku) and 35.5 (Ka) GHz
- GPM DPR resolution: 5 km
- GEO spatial resolution: 1-2 km
- GEO temporal resolution: 10 minutes
- GEO products: RAD, CLOUDS, RRQPE, ...
- GEO products are remapped on the GPM swath
- Temporal mismatch: < 5 minutes
- Parallax correction: not pre-applied
- Storm temporal evolution characterized by GEO products 60 minutes around the DPR scan time.

Applications

- Multimodal remote sensing research
- Synergistic use of VIS/IR/PMW/RADAR data
- Identification of hazardous atmospheric events (hail, icing, thunderstorms, ...)
- Analysis of storms structures
- Development of next-generation artificialintelligence models for GEO precipitation retrievals and severe weather monitoring
- GEO products evaluation and characterization of uncertainties.

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