

GPM-GEO

A Multimodal Remote Sensing Archive for Cloud and Precipitation Research

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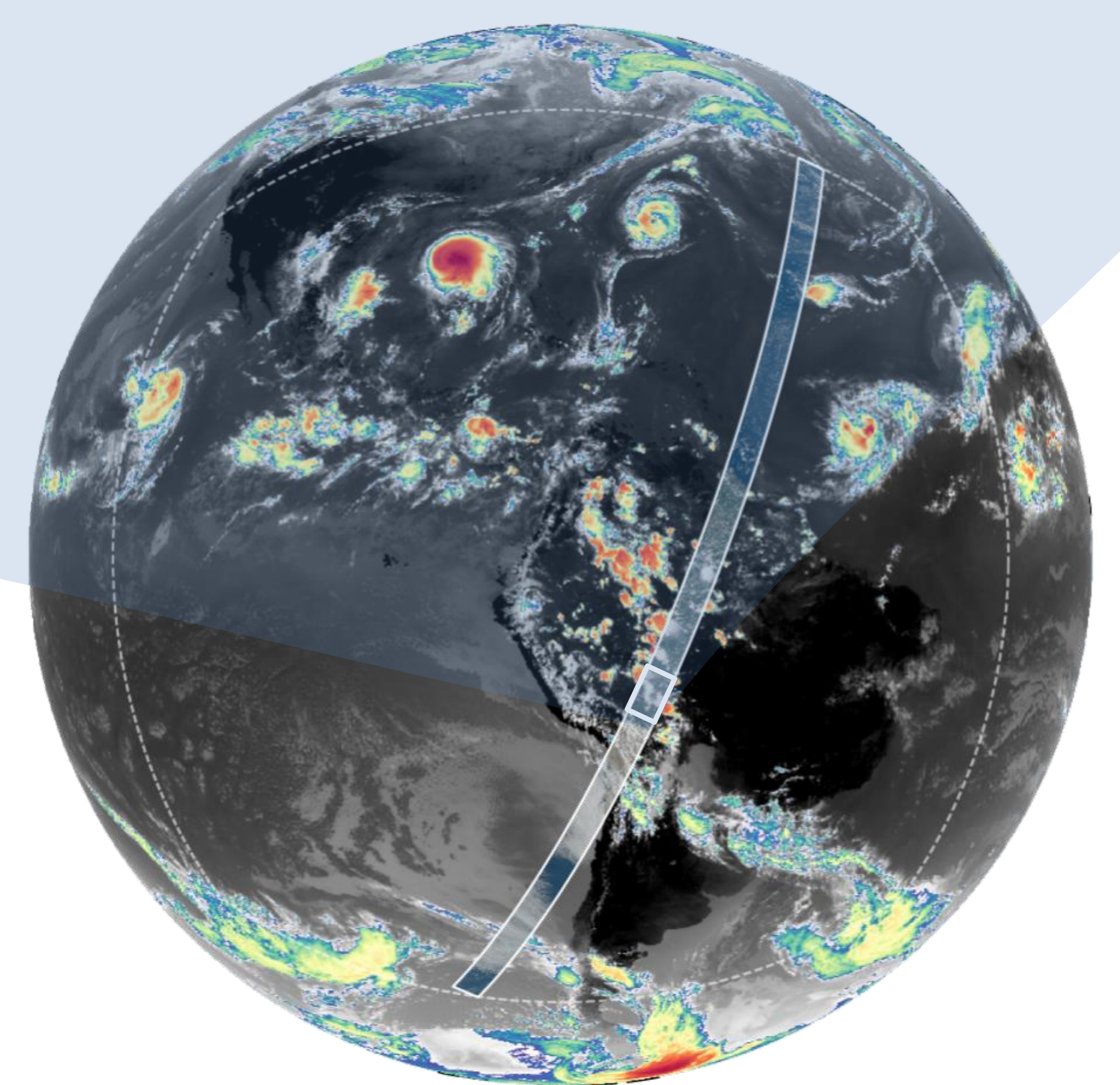
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Motivation

- The Global Precipitation Measurement Mission ([GPM](#)) Core Observatory satellite is equipped of 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 spatio-temporal [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.

Archive

- Time period: 2019 – present
- GEO sensors: GOES-16/17/18 ABI, Himawari-8/9 AHI
- GEO VIS/IR bands: 16 (0.47 – 13.3 μm)
- GPM PMW channels: 11 (10.65 – 183 \pm 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 [artificial-intelligence](#) models for [GEO precipitation retrievals](#) and [severe weather monitoring](#)
- GEO products [evaluation](#) and characterization of [uncertainties](#).

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