

# WG II Report

Presented to CGMS-54 Plenary, agenda item 5

## Overall message

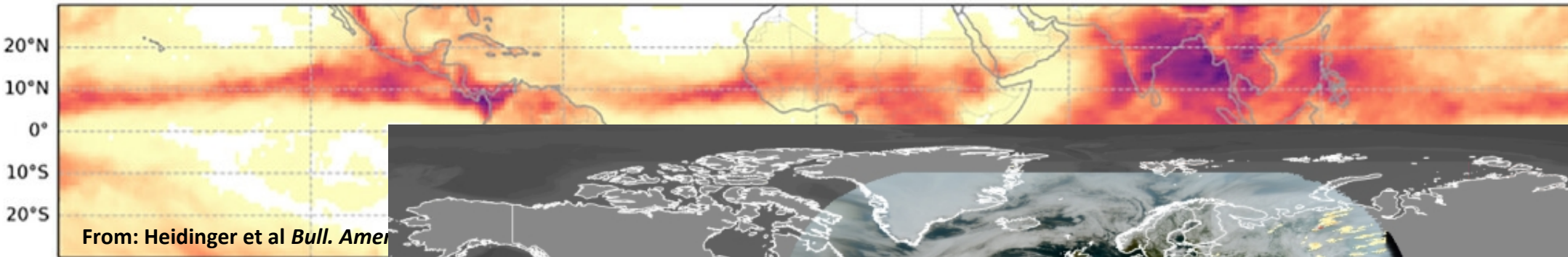
- **Building on the work of the International Science Working Groups, WG II provides essential coordination for product intercomparison, validation, technical harmonisation and future mission design, while also exploring emerging areas that may shape the development and use of satellite products.**
- GEO-Ring intercomparison supports 30-minute baseline for nowcasting and climate, while noting interest in near-real-time data for AI, potential lightning-Ring extension, and the need for common validation methods.
- Strong interest in making EO data more AI-ready, but maturity varies by agency. Key user challenges: data access speed, preprocessing load, cross-source interoperability, standards gaps, and platform constraints. Clear support for CGMS–WMO coordination on AI-ready best practices.
- CMA, EUMETSAT, and JMA highlighted advances in hyperspectral IR sounders. GEO sounders as a key next step for frequent profiling. Applications span nowcasting, NWP, boundary-layer, and chemistry-AQ. 3D wind retrieval needs further push to uptake by NWP centers.

# WGII priorities and meeting focus

- quality and interoperability – calibration (topic under GSICS);
- operational weather and earth system products;
- AI/ML readiness;
- climate and long-term records;
- user-driven future missions.

# GEO-Ring: from concept to operational coordination

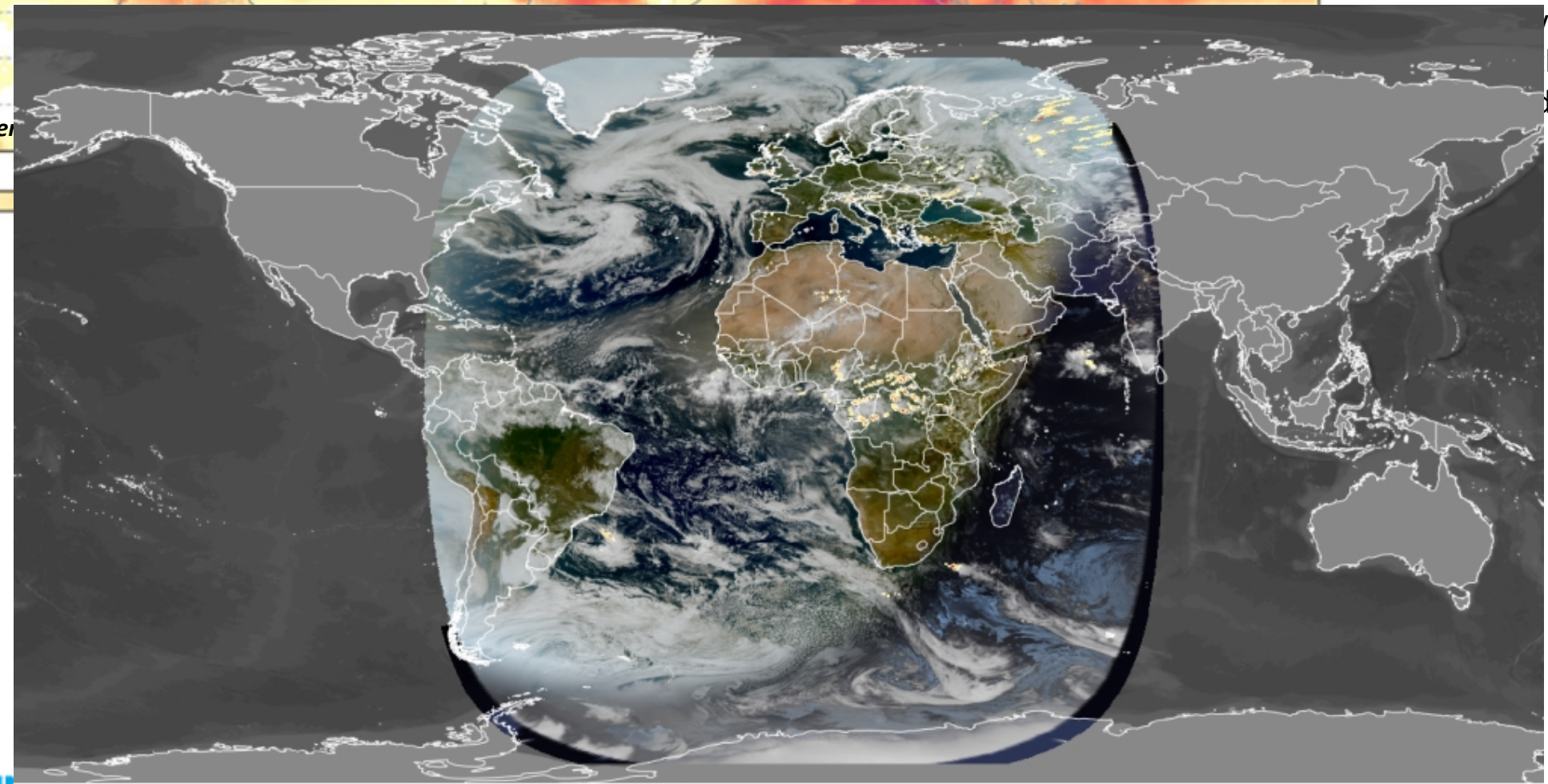
- GEO-Ring cloud-product intercomparison (reference data set ISCCP-NG);
- Interest for near-real-time products for AI training and inference;
- 15-minute full-disk observations were considered, but the 30-minute baseline consistent with nowcasting and climate req.;
- possible extension to lightning-Ring - need for common lightning validation methodologies;
- WGII Action A54.01



Map of the high-cold cloudiness associated with the data,

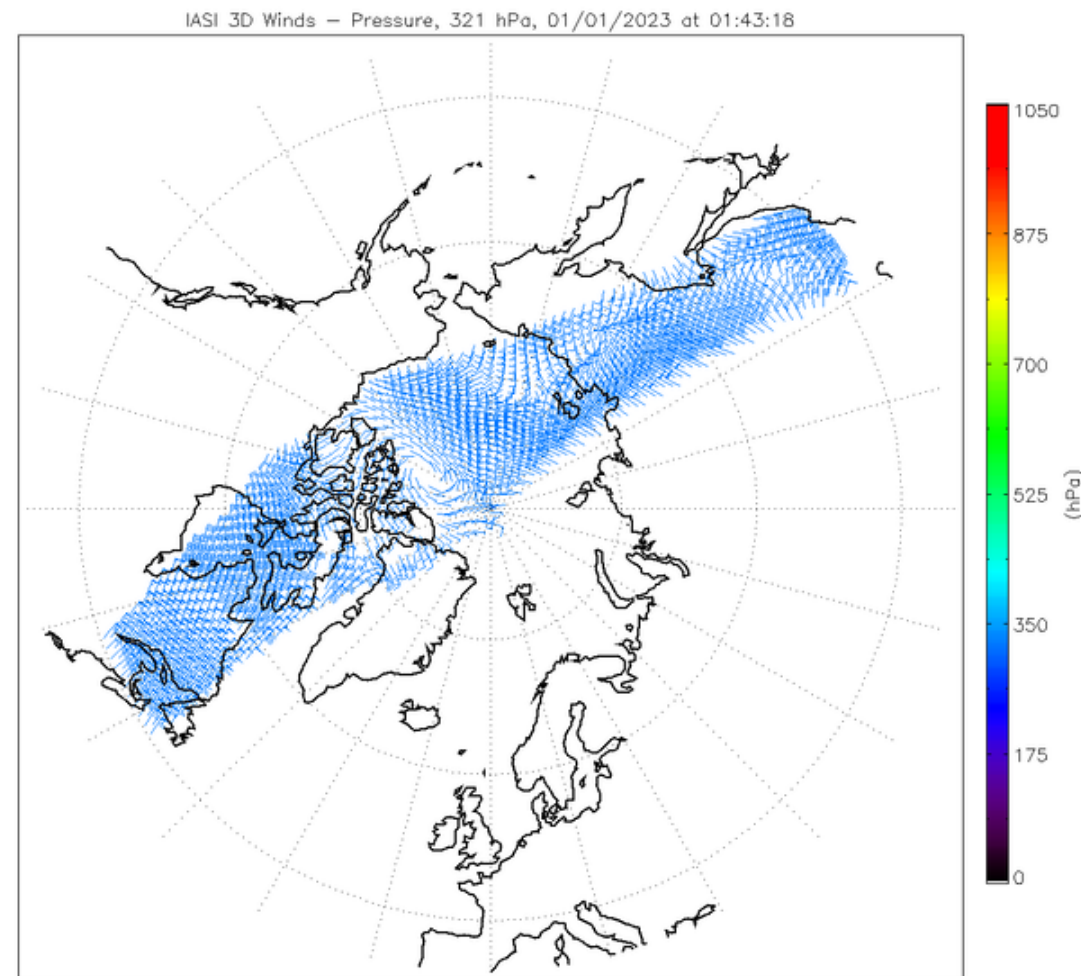
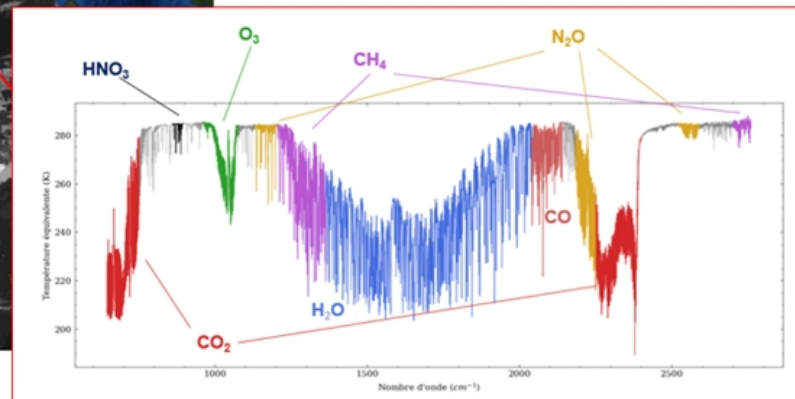
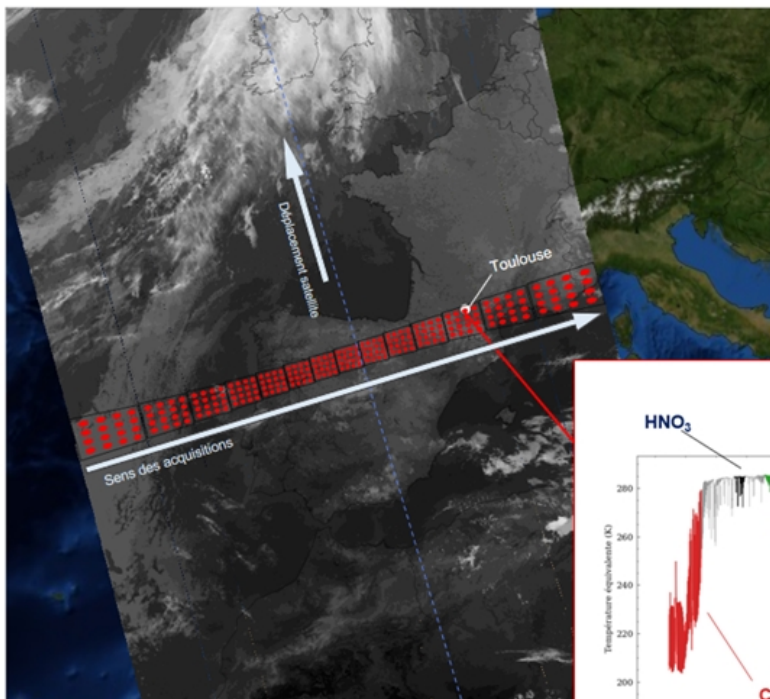


Extending the GEO ring to lightning (ex. From MTG LI)



# Hyperspectral sounding and 3D winds

- CMA, EUMETSAT, and JMA presented their latest advancements in polar-orbiting and geostationary hyperspectral infrared sounders;
- GEO sounders as a major next-step operational capability - frequent temperature/humidity profiling;
- nowcasting, NWP and boundary-layer applications but also synergetic chemistry-AQ applications;
- 3D winds from IR sounders – needs to push for further uptake by NWP centers;
- WGII Action A54.02.



The IASI 3D Winds processor uses optical flow techniques to obtain three-dimensional wind profiles over the polar regions from IASI Level 2 humidity, temperature and ozone data. It processes pairs of consecutive pole overpasses from the two currently available EPS satellites, Metop-B and Metop-C.

# Climate, GHG and long-term records

- CDRs are critical for climate, reanalysis and AI;
- Need to stress-test ECV continuity beyond 10 years vs key relevant missions;
- GHG roadmap and operational monitoring (see WGclimate presentation);
- coordination with WMO on G3W - observational network design under the WIGOS framework;

# Observing-system continuity and risk assessment

- low-inclination radio occultation risk;
- UV limb sounding risk;
- MW frequency-range representation in the CGMS baseline;
- SWIR categories for CO<sub>2</sub> and CH<sub>4</sub>;
- implications for WGII/WGIII coordination.

# CGMS HLPP topics: what to close, continue and elevate

## 01 Mature

*close / light-touch tracking*

- Common principal-component score representation
- Hyperspectral-sounder trade-off studies
- Current missions appear to converge on similar design choices

## 02 High operational value

*continue and exploit*

- Hyperspectral Level-2 intercomparison
- Observation-error characterisation
- Radiative-transfer modelling
- Direct benefits for NWP and product quality

## 03 Future HLPP emphasis

*elevate in the plan*

- Observing-system resilience: avoid over-tuning NWP and applications to today's instruments
- Integration of commercial satellite data
- AI/ML for product processing and data-management infrastructure
- Clearer survey and reporting mechanisms

### Core HLPP message

Shift the HLPP from “technical convergence only” towards resilience and governance of emerging data streams — while keeping the intercomparison, error and radiative-transfer work that is already delivering operational value.

# International Science Working Groups – key highlights

- ISWGs remain essential for intercomparison, validation, technical coordination and future mission design;
- Ensuring the proper level of expertise into ISWGs
- Support needed for websites, communication platforms and conferences;
- Stronger uptake of satellite products in impact studies – exploit the WMO potential, connect to NWP global centers, leverage on WMO obs. impact workshop;
- High risk of a service gap in the late 2020s due to no commitment for low-inclination RO observations. Five of six COSMIC-2 satellites remain operational. A 2023 analysis estimated a 50% chance of one failure every two years.
- Recommendation R54.01/WGII.

# Chair/Rapporteur status

- International Cloud WG: Andrew Heidinger will step down in September, so a new rapporteur is needed.
- International Precipitation WG: Pleased to hear that JAXA has nominated a candidate.
- International Winds WG: Ilana, currently co-chair, will move to the rapporteur role.
- International Surface/ Earth WG: Looking for a rapporteur; at this stage, a NOAA interim position is envisaged.
- WG Climate Vice-Chair rotation: ESA has put forward a candidate, S. Mecklenburg.

## Requested plenary attention

- Action - Coordination for lightning imager validation methodologies and for extending the GEO-ring concept to lightning – presentations and discussion to be organized at the next intersessional meetings.
- Action - Encourage the NWP community to assess the quality and impact of different satellite products—such as derived 3D wind products from IR sounders—as soon as possible after the data come online. Explore this through NWP agencies and via WMO operational and research groups.
- Recommendation - There was a strong request and recommendation to the CGMS Secretariat from the International Science Working Groups (ISWGs), particularly for supporting the respective web sites, communication platforms, and the organisation of technical conferences.
- Recommendation - Endorse continuation of IESWG as CGMS International Science Working Group
- Endorse relevant appointments