

Status Report of the International Wind Working Group Activities – Key Recommendations

Presented to CGMS-53 Plenary session, Agenda item 5

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Executive summary of the WP

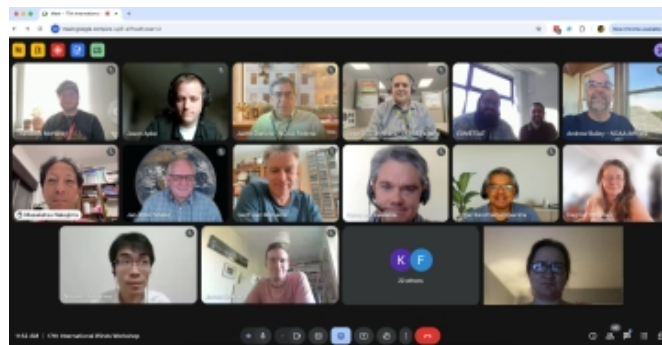
CGMS-52-IWWG-WP-02, 22 April 2024

The paper presents the ongoing activities and relevant discussion items of the International Wind Working Group (IWWG) since the CGMS-52 meeting.

- i. 17th IWW Summary
- ii. Recalls recommendations from CGMS-52
- iii. Progress on CGMS HLPP and related Actions



<https://cgms-info.org/iwwg/>



<https://www.ssec.wisc.edu/meetings/iwwg/2025-meeting/>

i. 17th IWWG Workshop

- **May 19-22, 2025** (after CGMS WG-II, March 2025)
- **Host:** NASA Langley / Lynker LLC
- **Co-Chairs:** iliana Genkova (Lynker@NOAA) & rapporteur Jaime Daniels (NOAA) for Feng Lu (CMA)
- **Meeting Format:** Virtual (75 attendees)
- **Talks - 50 , Posters – 10**
- **Sessions Covered:**
 - Status of operational winds
 - AMV derivation and quality
 - Use of satellite derived winds in NWP
 - Ocean surface winds
 - Aeolus, 3D winds, Stereo, and future missions
 - Airborne campaign supporting satellite missions
 - Reprocessing and climate applications
- **Poster session:** Popular addition to winds workshops
- **Plenary Discussions** (Report on webpage soon)
 - 5th AMV Intercomparison Study (Planning for)
 - Progress in ocean surface vector winds
 - AMV use in NWP & other applications
- **Working Groups**
 - WG1: Wind extraction methods
 - WG2: Wind assimilation and other applications

**Coordination Group for
Meteorological Satellites**

Add CGMS agency logo here (in the slide master)



ii. Recalls recommendations from CGMS-52

Recommendations from CGMS-52 WG-II at CGMS-52 Plenary, 5 June 2024

CGMS recommends all space agencies to participate in ICWG cloud product intercomparison using ISCCP-NG L1g data. It encourages collaboration between the IWWG and ICWG to identify ISCCP-NG “golden days” for cloud height retrievals suitable and available for evaluation by the AMV community.

ACTION: 5th AMV Global Intercomparison Study (being discussed)

- Confirm whether NWCSAF can finance another AMV Intercomparison Study in ~2027
- Univ. of Wisconsin led previous studies; Consider another lead to design and conduct the study
- What new aspects should the study focus on?
 - Use MTG-I images from a “golden day” identified in collaboration with ICWG
 - Include newer wind retrieval algorithms - IASI 3D winds, polar AMVs, stereo, optical flow winds, other novel winds
 - Involve operational and non-operational data producers
 - Consider ICWG input during the analysis

iii. Progress on HLPP and related Actions

HLPP 4.2.1: Establish commonality in the derivation of AMVs for global users where appropriate (e.g., through sharing of prototype algorithms) and consider backwards compatibility when designing AMV algorithms for the 16-channel imagers, so that present state-of-the-art algorithms can be applied to old imagery

A46.03: AMV producers to adopt the new AMV BUFR template

A46.06: IWWG to look at improving quality indicators for high resolution wind derivation for mesoscale and regional applications.

Recommendations

- AMV producers to provide further information on the AMV derivation and auxiliary cloud information in the new BUFR template, as available in their processing (as done by NESDIS and investigated by ECMWF)
- AMV producers to avoid use of NWP wind information for AMV rejection and in gross error checks.
- AMV users to continue evaluating new auxiliary AMV derivation and cloud information for enhanced AMV quality control.

ACTION IWW17 – WG1 : All remaining AMV producers to include as soon as possible “Common QI” and “new AMV BUFR template” in their AMV algorithms

ACTION IWW17 – WG1 : All AMV producers to update existing “2023 Survey on AMV products”, with current status of implementation and answers to additional questions (Coordinated by Javier García Pereda, then published in CGMS/IWWG website)

ACTION IWW17 - WG2 : AMV producers: to make use of the new BUFR template to provide further information on the AMV derivation and auxiliary cloud information, as available in their processing

HLPP 4.2.2: Investigate the best configurations to be used by the AMV producers for use in global and regional NWP models respectively, and clearly define the appropriate requirements for each of them

- A “living” document (so called “Requirement document”) created by Mary Forsythe/MetOffice and distributed to the IWWG NWP community was discussed again at 17th IWW. The document defines the best configuration for AMV algorithm development and testing. It was strongly agreed that this document will be updated as needed based on the latest scientific information received from the IWWG members.
- Testings for different AMV derivation configurations was done for polar AMVs by Roger Randriamampianina with NWC SAF/HRW software, but without relevant differences (presented at 17IWW).
- The latest version of the requirements document, incorporating feedback from the last workshop, would be disseminated to the working group for further input. The aim is to keep this as a living document and review it at each winds workshop.
- It was noted that for scatterometer data, lower grid spacing value (i.e. higher resolution) products are better for global models. For the AMVs, denser products could fill thinning boxes more effectively. (*statement was corrected on July 8, 2025*)

ACTION IWW17 – WG1/2 : IWWG chairs to make the “Requirement document” visible to the whole IWWG community, on the new CGMS/IWWG webpage, and collect suggested updates between workshops

HLPP 4.2.3: Assess value of derivation of winds from GEO hyperspectral IR (3D winds)

Progress/Recommendations

- Beyond the EUMETSAT Optical flow 3D wind profiles (for IASI now and later also for CriS and MTG-S/IRS), other institutions have defined, developed, or are now planning an equivalent optical flow product:
 - CIMSS already have a product with polar satellite sounders.
 - JMA is developing it for Himawari-10/GHMS sounder.
 - CIRA continues to refine Optical flow for mesoscale applications
- The need of HPC/High Performance Computing for Optical flow can be skipped with Deep Learning (shown in the 17IWW by Jan-Peter Muller/UCL).
- EUMETSAT to provide related info from concurrent MTG-S/IRS Workshop in Darmstadt.

HLPP 4.4.1: Establish a common vocabulary and methodology with appropriate error propagation to include the errors associated with validation data

Progress/Recommendations

- “Common vocabulary” in the Atmospheric wind products can be defined through “CF compliant netCDF outputs” (which start to be common in many production centres).
- NWP SAF Atmospheric Motion Vector (AMV) monitoring (<https://nwpsaf.eu/monitoring/amv/>) provides useful tools to monitor, document and investigate error characteristics of AMV data.
- NWP SAF (Met Office) to continue generating AMV monitoring analysis reports - release in advance of and presented at the IWW, to guide the discussion on improvements for AMV derivation and data assimilation

Recommendations be considered by CGMS:

IWW17-WG2: NWP Users to consider evaluating stereo AMV products and particularly to understand how the height assignment compares to existing approaches and model best-fit pressure. NOAA to ensure that the contributing satellites of each stereo AMV can be identified from the BUFR files.

IWW17-WG2: NWP centres encouraged to test assimilation of full scatterometer constellation and to consider handling of large geographical model biases. Several talks reported progress with the operational assimilation of HY-2B/2C and Oceansat-3. Timeliness remains an issue for the HY-2 wind products, even with EUMETSAT supporting downlinks from Finland for a limited number of orbits. It is recommended that KNMI/EUMETSAT work with NSOAS to continue to improve the timeliness of the HY-2* scatterometer wind products.

IWW17-WG1/2: IWWG co-chairs and CGMS to investigate options for online discussion forum suitable for everyone. NWP centres to consider exchanging results on new datasets or changes to existing datasets via discussion forum. AMV producers to communicate better product changes, product outages, instrument updates.