



# Atmospheric Composition Sub-Group Report

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# Outline

- ✓ Introduction
- ✓ Review of atmospheric composition missions
- ✓ 2008 sub-group activities
- ✓ Status of past recommendations

## What is the ACSG?

- ✓ The focus of ACSG is atmospheric chemistry (for example ozone, nitrogen dioxide and other tropospheric constituents) and composition (for example aerosols and greenhouse gases)
- ✓ ACSG consists of 15 members from space agencies and other relevant agencies and organizations with experience in calibration, algorithm development, groundbased instrumentation, modeling and validation
- ✓ ACSG is a forum that fosters interactions between mission scientists and data users, recommends network validation sites, develops comprehensive validation methodologies involving ground-based and space-borne assets, and specifies comprehensive and consistent multi-mission validation datasets

# Status of AC missions

## ✓ Current:

- *ESA Envisat (3/'02): 3 AC instruments (GOMOS, MIPAS, SCIAMACHY) operating well; fuel depleted in 2011 timeframe; orbit maneuver proposed to extend mission life to 2013 (to be confirmed in late 2008)*
- *NASA Aura (7/'04): nominal operations of 3 AC instruments (OMI, MLS, TES); HIRDLS instrument failure in March; platform fuel through 2015*
- *A-Train: Aqua, Calipso, CloudSat, Parasol (and Aura) operating nominally*
- *MetOp-A (10/'06): GOME-2 and IASI operations nominal*
- *ERS-2 GOME, NOAA-16/17/18 SBUV/2, Odin OSIRIS/SMR, SCISAT-1 ACE*

# Status of AC missions

## ✓ Up-and-coming:

- *JAXA/NIES GOSAT: global CO<sub>2</sub> and CH<sub>4</sub> measurements, to be launched in 2009*
- *NASA Glory mission: aerosols/black carbon, to join A-Train in 2009*
- *NASA OCO: global CO<sub>2</sub> measurements; instrument problems; to join A-Train in 2009*
- *NSMC/CMA FY-3a with SBUS and TOU ozone instruments, to be launched in 2009*
- *ESA ADM-Aeolus: wind and aerosols, to be launched in 2010*
- *NPOESS Preparatory Project (NPP) launch scheduled for 2010 (in A-Train)*

## 2008 sub-group activities

- ✓ Preparations and contributions to GEO/CEOS QA4EO Workshop
  - *May workshop attended by sub-group members*
  - *Limited review of QA4EO draft documents*
  
- ✓ Synchronization of atmospheric composition cal/val data archives:
  - *Involving: ESA GECA, NASA AVDC, NDACC DHF, EC GEOMon archive*
  - *In situ and satellite data sharing, format and data requirements (information content)*
  - *Led by experts in the field*
  - *Follow-up of WGCV-26 rec. 2 (and WGCV-27 rec. 4)*
  - *Possible contribution to DA-06-04 (data, metadata, product harmonization)*
  - *Contact: R. Koopman, ESA-ESRIN*

## 2008 sub-group activities (2)

- ✓ Coordination of validation baseline for AC level 2 products:
  - *First (of 5) ozone instrument absolute calibration campaigns in Europe/ Africa - first campaign ended September 26 (ref. WGCV-27 rec. 1)*
  - *First (of 3) groundbased tropospheric chemistry/air quality intercomparisons to be held in Italy in 2009 (ref. WGCV-27 rec. 3)*
  - *Lidar intercomparisons/characterization using European and NASA mobile ref. instruments to begin in 2009*
  - *Close coordination between ESA-ESRIN and NASA-GSFC*

## 2008 sub-group activities (3)

- ✓ Organized a GHG validation validation workshop
  - *Initial focus on carbon dioxide (carbon dioxide and methane)*
  - *Meeting held in May 2008 at CalTech with OCO and GOSAT teams, and European CO<sub>2</sub>/CH<sub>4</sub> teams*
  - *25 attendees from NASA, ESA, JAXA/NIES, TCCON, NDACC, aerosol teams, and CO<sub>2</sub> profiling mission study scientists (NASA and ESA)*
  - *Key recommendations:*
    - Validation data sharing between mission teams
    - Validation coordination (EC-06-01/WGCV-28 rec. 1)
    - Characterization of ground sites using aircraft essential prior to sat. missions
    - Recommendation that GHG be part of ACC (EC-07-03, WGCV-28 rec. 2)

## 2008 sub-group activities (4)

- ✓ Validation of merged/combined data products
  - *For example:*
    - Validation of MODIS/Calipso merged aerosol products
    - Validation of combined L3 products (albedo/reflectivity, clouds, water vapor, aerosols, etc.)
  - *New activity in sub-group (see ref. WGCV-28 rec. 3)*
  - *Challenges lie in QA4EO implementation*
  - *Applies to NASA MEASURES and ESA Data User Element (DUE) projects*

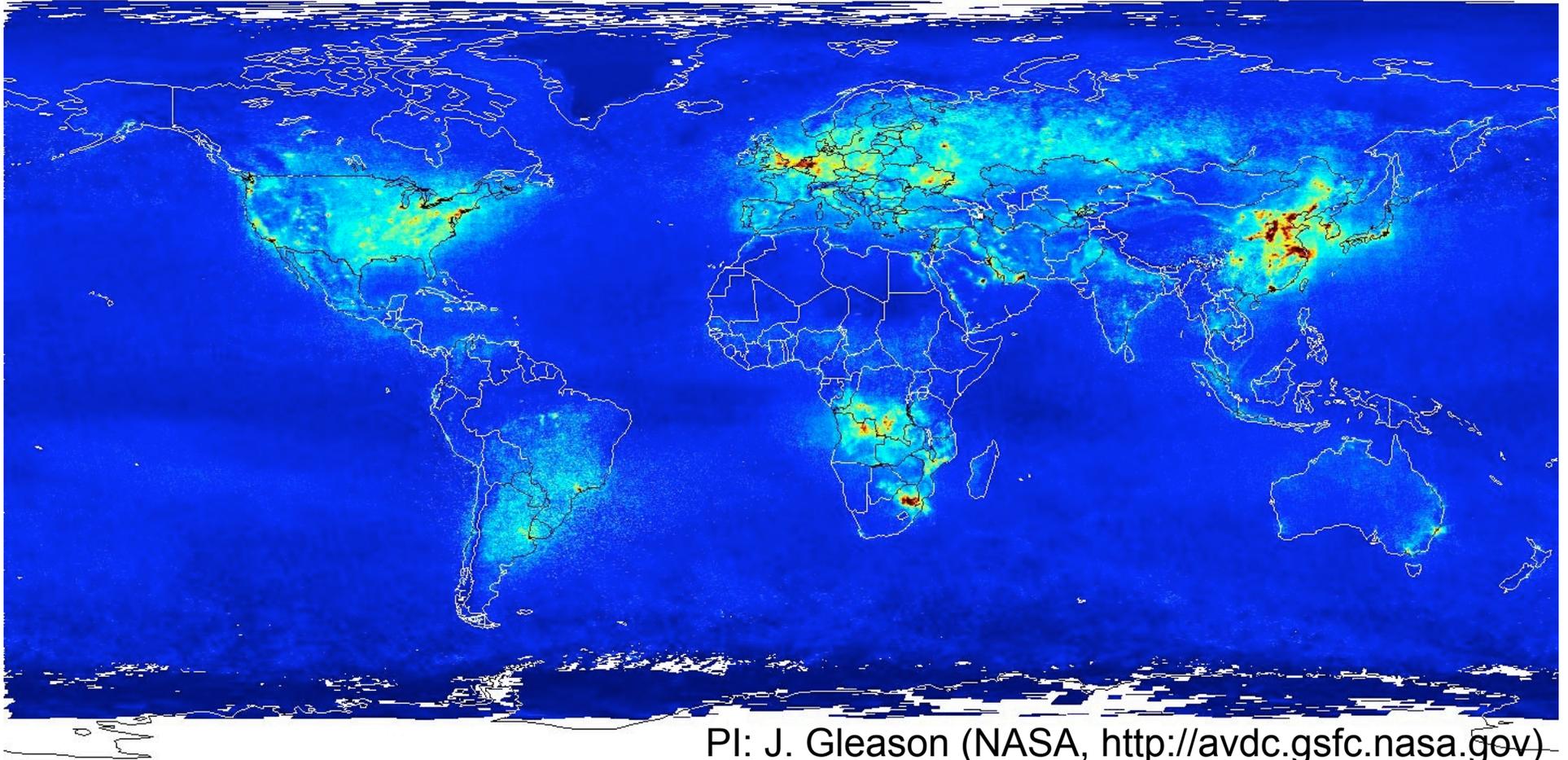
## Review of past recommendations

- ✓ Overall, ACSG recommendations since WGCV-26 have been follow-up and are either closed or in the process of being completed.

***but...***



# Tropospheric NO<sub>2</sub>, August 2008



PI: J. Gleason (NASA, <http://avdc.gsfc.nasa.gov>)

## Review of past recommendations (2)

- ✓ WGCV-27 rec. 3: NO<sub>2</sub> groundbased instrument intercomparison
  - *Intercomparisons are essential as AQ constituents are increasingly retrieved from space and new missions are proposed*
  - *ESA-NASA lead initiative*
  - *First campaign to take place in Italy (ESRIN) during June-July 2009*
  - *Second campaign to take place in 2011 – location TBD*
  - *To include European, US, Chinese and Japanese teams*
  - *Supported by UAV and possible ultra-lite aircraft or measurement grid*
  - *To measure NO<sub>2</sub>, Formaldehyde, glyoxal, water vapour and aerosols*
  
- ✓ Concern:
  - *NASA participation is now uncertain, while ESA budget allocated and the consortium formed (late 2007)*
  - *Essential to stress importance of this rec. and answer SIT action 22-5*

# ACSG recommendations WGCV-29

## ✓ Recommendation #1 to WGCV:

- *Follow through with WGCV-27 rec. 3 (NO<sub>2</sub>/AQ groundbased instrument intercomparison campaigns)*
- *Impacts:*
  - ESA, NASA, NOAA
  - End-users such as EPA, EEA, etc.



Thank you!