Status Report from the International (A)TOVS Working Group (ITWG)

Allen Huang & Steve English, Co-chairs

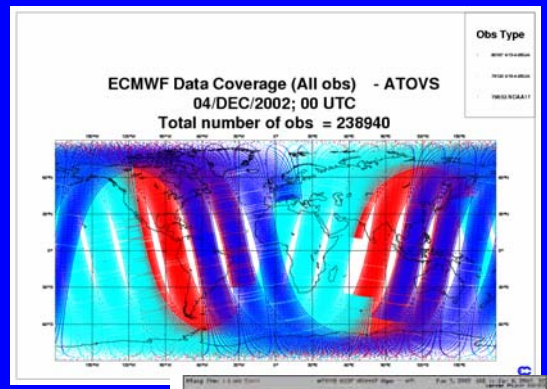
Perugia, Italy 9 July 2007

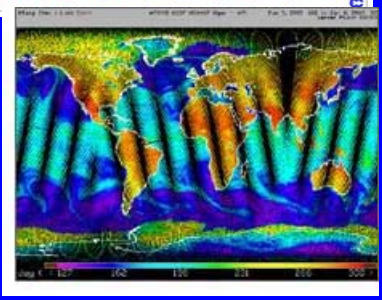
http://cimss.ssec.wisc.edu/itwg/

Working Groups:

- Advanced Infrared Sounders
- ATOVS/TOVS data in NWP
- ATOVS/TOVS in climate studies
- International Issues and Future Systems
- Radiative transfer and surface property modeling
- Satellite Sounder Science and Products

Sharing ideas, plans and techniques to study the earth's weather using space-based observations





Technical Sub-Groups:

- AAPP (ATOVS and AVHRR Pre-Processing Package)
- ICI (Inversion Coupled with Imager)
- IAPP (International ATOVS Processing Package)
- 3I/3R (Improved Initialization Inversion)
- IMAPP (International MODIS and AIRS Processing Package)
- Frequency Management
- RTTOV (Radiative Transfer (A) TOVS)

ITWG Mission

The ITWG serves as a forum for operational and research users of TIROS Operational Vertical Sounder (TOVS), Advanced TOVS (ATOVS) and other atmospheric sounding data to exchange information on methods for extracting information from these data to create atmospheric variables, and on the impact of these data and products in numerical weather prediction and in climate studies.

ITWG organizes the International TOVS Study Conferences (ITSC), which have met every 18-24 months since 1983.

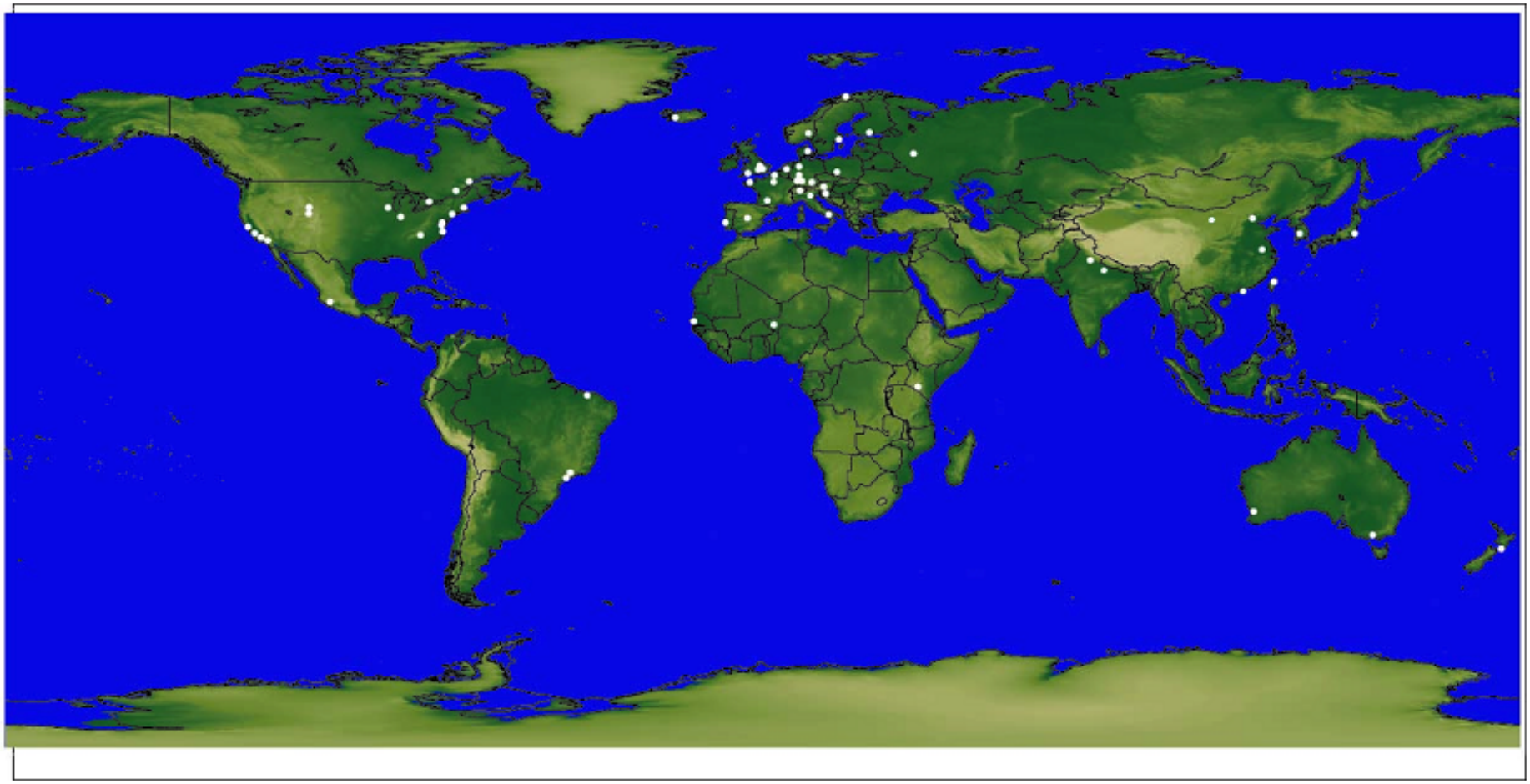
ITWG Mission - continue

The ITWG meetings result in recommendations and actions to guide the directions of future research and to influence relevant programs of the WMO and satellite provider agencies (e.g. NASA, NESDIS, EUMETSAT, NSMC, JMA, ISRO).

An important part of the group's work has been to foster and participate in the generation of software to be shared throughout the community to enable use to be made of these data for operations and research.

The group also is developing an important education and training role through the WMO and other collaborative and member actions.

ITWG Members are located worldwide



ITSC-14, Bejing, China: 125 participants from 21 countries

WMO, NOAA, NASA, ECMWF EUMETSAT, CMA, JMA, ISRO CPTEC/INPE, ABOM, Meteo France, UK MetOff, LMD, CWB, NIWA, Universities ….

ITSC-15, Maratea, Italy: 110 participants from 16 countries

ITWG

Working Groups & Technical Sub-Groups

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- ATOVS/TOVS data in NWP
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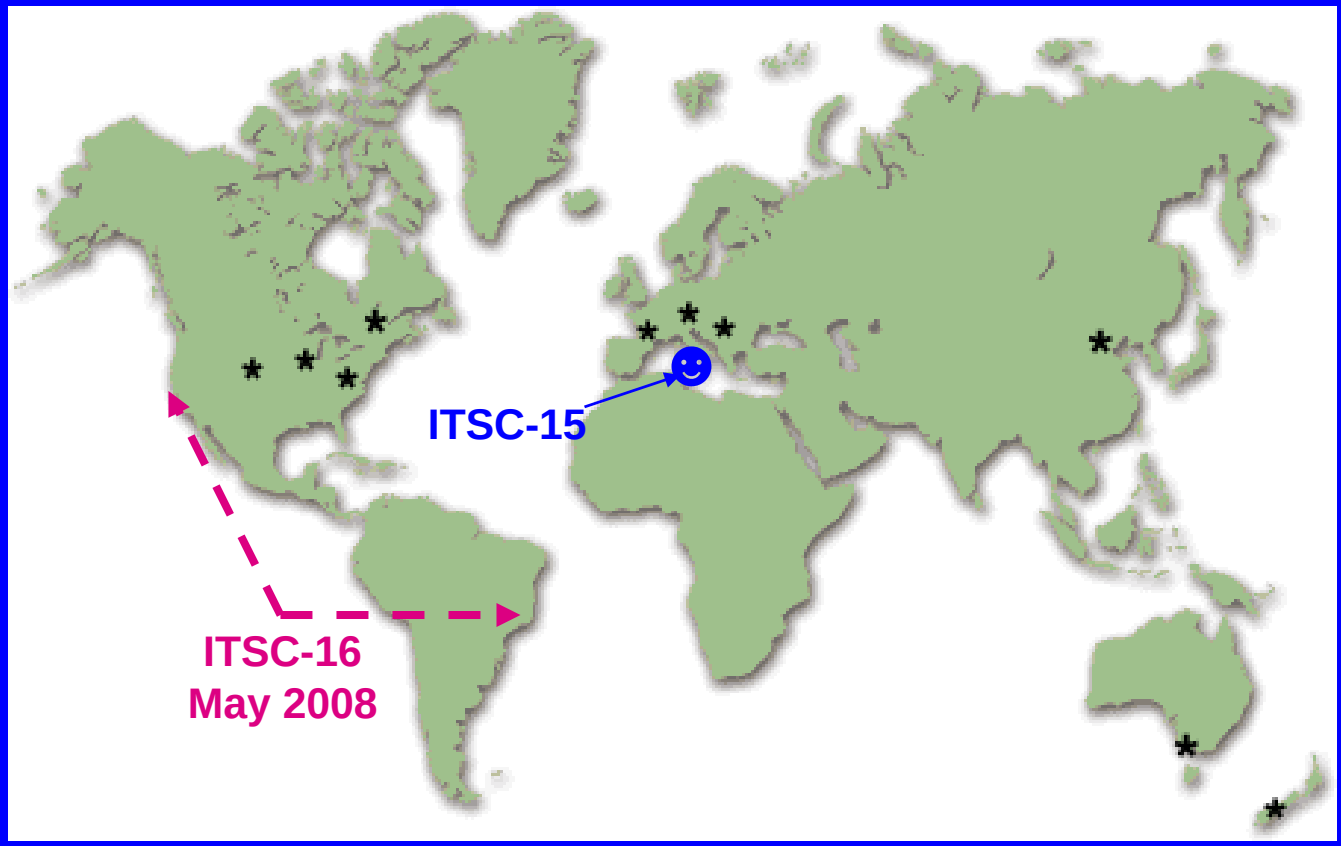
ITSC 1-15 Locations



1st Meeting in Igls, Austria – August 1983
Europe (8), NAM (4), Asia/Oceania (3)

ITWG Co-Chairs

• ITSC 1-3	Bill Smith	Univ. Wisconsin
	Rolando Rizzi	Univ. Bologna
• ITSC 4-6	Alain Chedin	LMD
	Paul Menzel	NOAA
• ITSC 7-9	John Eyre	UK Met Office
	Mike Uddstrom	NIWA
• ITSC 10-12	Guy Rochard	Meteo-France
	John LeMarshall	ABoM
• ITSC 13-15	Roger Saunders	UK Met Office
	Tom Achtor	Univ. Wisconsin
• ITSC 16-18	Allen Huang*	Univ. Wisconsin
	Steve English*	UK Met Office

* : Current

International TOVS Working Group - Mozilla

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http://cimss.ssec.wisc.edu/itwg/ Search

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INTERNATIONAL ATOVS WORKING GROUP

http://cimss.ssec.wisc.edu/itwg/

Sharing ideas, plans and techniques to study the earth's weather using space-based observations

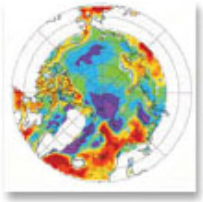
ITWG Overview
About the ITWG, its mission, and co-chair information

Working Groups/Technical Sub-Groups
Focusing on key issues, topics and software

International TOVS Study Conferences (ITSC)
Future meeting information, past meeting reports and presentations

Education and Training
Outreach and training programs involving members

Members, Organizations, and Links
Participants and their organizations, plus related web sites



- Email the Co-Chairs
- ITWG Webmaster

Updated 30 March 2006

News and Highlights

ITSC-XV: Maratea, Italy
4-10 October 2006

NEW! Second Circular

More information (including key dates)

A Tribute to Guy Rochard (1946-2005)
Visit the tribute web page

ITSC-XIV: Beijing, China
25-31 May 2005

Proceedings available as PDF

Working Group Report available as PDF

Presentations and posters

Photo Gallery

ITWG Working Groups & Technical Sub-Groups

ITWG Home

ITWG Overview

Working Groups/
Technical Sub-Groups

International TOVS
Study Conference

Education and Training

Members, Organizations,
and Links

Email the Co-Chairs
ITWG Webmaster

Working Groups

Information on all the Working Groups listed below is contained in "A report on the Eleventh International TOVS Study Conference (ITSC)." Please visit the ITSC web page for availability information.

- **Advanced Infrared Sounders**
  Planning and recommendations in preparation for future instrumentation
  http://cimss.ssec.wisc.edu/itwg/aswg/
- **ATOVS/TOVS data in NWP**
  Operational and research applications of low earth orbit (LEO) sounder data in numerical weather prediction
  http://cimss.ssec.wisc.edu/itwg/nwp/
- **ATOVS/TOVS in climate studies**
  Studies applying the 30 year climate database from the NOAA polar sounder
- **International Issues and Future Systems**
  Cooperative actions with the international weather satellite community on issues involving polar remote sensing
- **Radiative transfer and surface property modelling**
  Fostering the development of radiative transfer and surface models for ATOVS applications
  http://cimss.ssec.wisc.edu/itwg/groups/rtwg/rtwg.html
- **Satellite Sounder Science and Products**
  Promoting the development and utilization of meteorological techniques and products from operational and research satellites in weather and climate applications
  http://cimss.ssec.wisc.edu/itwg/sssp/index.html

Technical Sub-Groups

Information on all the Technical Sub-Groups listed below is contained in the Reports of the International TOVS Study Conference.

- **AAPP (ATOVS and AVHRR Pre-Processing Package)**
  AAPP is the ATOVS direct broadcast pre-processing software developed by the EUMETSAT Satellite Application Facility for Numerical Weather Prediction (NWP SAF).
  http://www.metoffice.com/research/interproj/nwpsaf/
- **ICI (Inversion Coupled with Imager)**
  ATOVS Temperature and moisture retrieval software from Meteo-France
  http://www.meteorologie.eu.org/ici/index.html
- **IAPP (International ATOVS Processing Package)**
  http://cimss.ssec.wisc.edu/opsats/polar/iapp/IAPP.html
- **3I/3R (Improved Initialization Inversion)**
  Temperature and moisture retrieval software
- **IMAPP (International MODIS and AIRS Processing Package)**

- Products and Science
- Scientific Processing Packages
- Current/Future Weather Satellite Programs
- Operational Instrument Characteristics and Performance
- Direct Readout
- Cal/Val
- Useful Datasets for Satellite Data Processing

ITWG Home

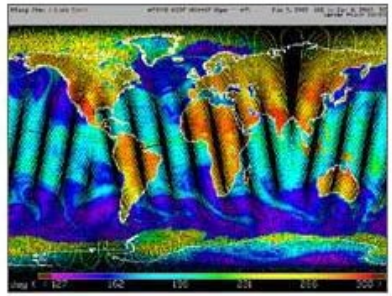
Updated 26 April 2005

International TOVS Working Group

Sub Group for Satellite Sounder Science and Products

Co-Chairs: Tony Reale, NOAA/NESDIS/ORA
Lydie Lavanant, Meteo-France

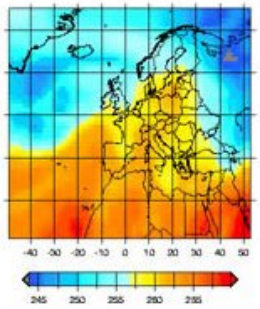
About the SSSP



The mission of the sub group on Satellite Sounder Science and Products (SSSP) is to create a forum for scientific algorithms and products from operational and research weather satellites, and to promote scientific exchange among the international group of researchers and product developers.

The goal of this web site is to establish a mechanism for the dissemination and exchange of information across the international community on available research, techniques and products.

The contributions are currently divided into science and product areas. Click on a topic to go to a listing of contributions for any area.



More about SSSP...

SSSP Survey

The SSSP co-chairs recently conducted a survey of satellite operators who distribute global polar satellite observations and related products and datasets. See more information in our NEW! section on Current/Future Weather Satellite Programs.

Want To Share Your Research on this Site?

Find out how to contribute.

Email the Co-Chairs
Email the SSSP Webmaster

ITWG Home

ITWG Overview

Working Groups/ Technical Sub-Groups

International TOVS Study Conference

Education and Training

Members, Organizations, and Links

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ITWG Webmaster

ITSC-XV: Maratea, Italy, 4-10 October 2006

NEW! Second Circular is now available!

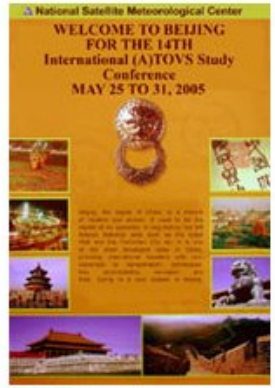
Learn more about the meeting site... Villa del Mare

Key Dates (updated 30 March)

3rd Circular	1 July 2006 (last call for abstracts)
Abstracts Due	7 July 2006
Draft Program	15 August 2006
Final Program	15 September 2006
ITSC-15	4-10 October 2006

See also:
First Circular

ITSC-XIV: Beijing, China, 25-31 May 2005



Click for larger version.

Proceedings (added 2 December 2005) -- Download the complete proceedings or individual sections

- Complete report (PDF)
- Individual Papers via web page (papers in PDF format)

Working Group Report (added 27 September) -- Download the complete report or individual sections

- Complete report (PDF)
- Foreword and Participant List (PDF)
- Executive Summary (PDF)
- Working Group Reports (PDF)
- Technical Sub-Group Reports (PDF)

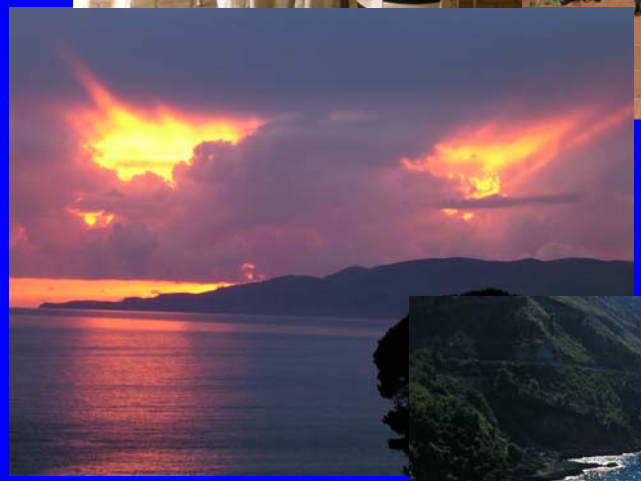
Presentations and Posters (added 30 June)

Photo Gallery (added 27 June)

Awards for Best Oral Presentation and Best Poster

The **Best Oral Presentation** was awarded to **Clémence Pierangelo of LMD/IPSL Ecole Polytechnique** for her talk on "Retrieving the effective radius of Saharan dust coarse mode with AIRS observations." Co-authors on the presentation include Michael Mishchenko, Yves Balkanski, Alain Chédin.

ITSC-15 Maratea, Italy
4-10 Oct 2006



77 oral and 50 poster presentations
All are available from
http://cimss.ssec.wisc.edu/itwg
110 participants from
16 countries

ITSC-15 Science Presentations

- Radiative transfer and surface modeling
- Climate applications
- ATOVS cloud studies
- Direct broadcast software, education and frequency protection (dedicated to Guy Rochard)
- Preprocessing and calibration
- Operational use of ATOVS
- Developments in use of ATOVS in NWP
- International Issues and Agency Status Reports
- Products from ATOVS
- METOP Developments
- Future sensors

ITWG Special Focus Working Groups - Reports provided by each group

1. Use of TOVS/ATOVS in Data Assimilation and Numerical Weather Prediction
2. Satellite Sounder Science and Products
3. Radiative Transfer and Surface Property Modeling
4. Use of TOVS/ATOVS Data in Climate Studies
5. Advanced Sounders
6. International Issues and Future Systems

ITSC-15 Major Conclusions

1. The results of new observing system experiments presented at ITSC-XV demonstrate that **satellite data have a large impact on weather forecast accuracy and promising new results** suggest the potential for future enhancements in the use of satellite sounder and imager data. It is crucial that future instruments as a baseline maintain, and if cost effective improve upon, the quality of AMSU and AIRS.
2. Many NWP centers are now **assimilating radiances from the advanced infrared sounder**, AIRS, and getting significant positive forecast impacts. The use of the warmest field of view, in the AMSU-A footprint, recommended at the last conference has replaced the centre field of view used initially.
3. The **AIRS radiances assimilated are still a small fraction of those available** but some efforts are underway to allow a more complete use of the AIRS data (e.g. through use of reconstructed radiances).
4. Many NWP centres are ready to assimilate IASI radiances once they become available with the help of NESDIS who have provided a simulated IASI dataset. A channel sub-set of about 300 IASI radiances has been identified for distribution to NWP centres on the GTS.

ITSC-15 Major Conclusions - continue

5. Many NWP centres are ready to assimilate IASI radiances once they become available with the help of NESDIS who have provided a simulated IASI dataset. A channel sub-set of about 300 IASI radiances has been distributed to NWP centres on the GTS.
6. The number of NWP centres using level 1b ATOVS radiances in their variational assimilation systems continues to grow but there are still centres who rely on the level 2 retrievals provided by NESDIS.
7. The Regional ATOVS Retransmission Service, RARS, has been developed since ITSC-XIV. The EUMETSAT EARS service has continued to expand and more NWP centres are using the EARS data. The Asia-Pacific RARS has started operations and NWP centres are already beginning to assimilate ATOVS data from RARS data stream. RARS networks in S. America and Africa are being planned. The group encouraged WMO and the space agencies to continue to develop this ATOVS retransmission service as a low cost means of providing more timely ATOVS data over most of the globe.
8. The group also noted the good progress by NOAA to reduce the delay in the NOAA blind orbits for the global dataset by using the Svalbard ground station.

ITSC-15 Major Conclusions - continue

9. It was noted that the SSM/I sensor on DMSP-F15 was no longer being used by users due to the beacon interference with the 23GHz channel. A process to clean up the data was presented at the conference which should be made available to the users to allow them to assess if they can start to use data from this satellite again.
10. Considerable progress in the pre-processing of SSMIS data has been made with at least one NWP centre now able to use the sounding channels operationally. Further improvements to the pre-processing were identified during the conference. The group encouraged the SSMIS cal/val team to make the data available from DMSP-F17 as early as possible after the launch to expedite their use in operational systems.
11. A third high spectral resolution sounder workshop was held at Madison, Wisconsin, USA in April 2006 to allow a more detailed discussion of scientific issues related to advanced sounders with many eminent scientists attending. These workshops also educate and train young scientists entering the field.

ITSC-15 Major Conclusions - continue

12. An ITWG workshop on remote sensing and modeling of surface properties was held in Paris, France in June 2006 allowing a focused discussion on this aspect of radiative transfer in order to facilitate more use of the sounder data over land. It is planned to hold another workshop in early 2008.
13. The community software packages for processing locally received ATOVS data have been upgraded to allow data to be processed from METOP, including IASI. The updates will shortly be available for free distribution to users. This kind of ATOVS processing software has been essential in the use of ATOVS data by the meteorological community.
14. A freely available software package for processing locally received MODIS and AIRS data is being used by many countries for imagery and for Level 2 products. This IMAPP software also adds applications from AMSR-E. Future development of DB packages for METOP-IASI, NPP AND NPOESS are also planned.
15. The group urged space agencies to provide documentation on data formats well before launch to allow similar community software packages to be developed for planned new satellites (e.g. FY-3 and NPP).

ITSC-15 Major Conclusions - continue

16. The group noted the increasing threat of RF interference in microwave imager channels as demonstrated by AMSR-E and all members were urged to lobby their respective radio communication authorities to support protection of the imager and sounder bands.
17. A presentation on the need to foster training on remote sensing measurement systems and products to young scientists was given and the group agreed to enhance its efforts in education and training through a dedicated section of the web site. A workshop to co-ordinate satellite meteorology training was also proposed along with the possibility of certification of some courses. Satellite provider agencies were encouraged to continue and expand their support for education and training of the next generation of remote sensing scientists.
18. It was recommended that as the NOAA-18 HIRS is not providing good data the HIRS on METOP should be used with the new 10km field of view to allow comparisons with the 17km field of view on NOAA-17 HIRS in terms of yield of cloud free radiances. This field of view difference should be studied to consider the requirement for the field of view size for future sounders.

ITSC-15 Major Conclusions - continue

19. The group was pleased to note that the Integrated Program Office (IPO) has decided to put NPP into a PM ascending orbit as recommended by the ITWG at ITSC-XIV to provide continuity with Aqua/AIRS. This will help to ensure at least long term atmospheric sounder coverage in 2 orbits.
20. The time series of (A)TOVS now exceeds 27 years and the quality and number of climate products continues to grow. One sign of the importance of climate studies to society, is that there are now efforts emerging to support the routine, operational production of TOVS Climate Data Records at several centers.
21. The group supported the continuing efforts to develop the GCOS Atmospheric Reference Observation Network (GARON) for climate with the primary objective of creating long term records of critical upper air measurements and associated error characteristics to support their continuing integration in climate applications and research.

ITSC-15 Major Conclusions - continue

22. The ITWG recommended that satellite agencies support the new WMO Global Space based Inter-calibration System (GSICS) to improve the accuracy of global satellite observations for weather, climate and environmental applications through an operational inter-calibration of the space component of the World Weather Watch (WWW)'s GOS and GEOSS.
23. The recent NOAA-14 pitch maneuver to investigate the calibration of the radiometers was welcomed as a useful end of life activity and may provide new information on the calibration of the sensors.
24. The group recommended studies to quantify the benefits of dual polarisation channels on conical scanning microwave radiometers for sounding channels which have significant surface contributions to assess if enhanced discrimination of surface effects is possible.
25. It was recognised that high spectral resolution imaging radiometers on geostationary platforms are likely to be an important part of the future global observing system. It was recommended that a demonstration mission be conducted in the near future. GIFTS is the best current option for such a mission

ITSC-15 Major Conclusions - continue

26. The group was concerned that critical climate monitoring instruments have been removed from NPOESS, specifically the loss of CrIS/ATMS in the 0530 orbit plane, removal of the limb instrument for ozone monitoring, and the Earth Radiation Budget sensors. Removal of CrIS/ATMS in the 0530 orbit seriously affects the monitoring of the diurnal cycle. The removal of ERBS breaks the climate series of a 30 year continuous climate sensor time series. Several options to mitigate this loss were proposed.

Activities since ITSC-15

- **6th ITWG Co-chairs are selected:**

  Dr. Steve English, UK Met Office, UK

  Dr. Hung-Lung Allen Huang, UW-Madison, US

  will served to organize ITSC-16,17 & 18.
- **An international Direct Readout Meeting is planned for April 2008 and to be hosted by Centre for Remote Imaging, Sensing and Processing (CRISP) of Singapore.**
- **Next ITWG meeting, ITSC-16 is planned to take place on 7 to 13 May 2008 to be hosted by CPTEC/INPE of Brazil (still negotiating the final conference details).**

Activities since ITSC-15 - continue

- **In addition to ITSC-XV Working Group Report, a Proceedings for ITSC-XV from the papers submitted are provided to attendees and other interested persons on CD-ROM. The oral and poster presentations from ITSC-XV are already available as pdf files which can be downloaded from the ITWG web site.**

Two copies of the reports and proceeding CDs are available for IRC members

ITWG Future Plans

- ITWG will continue to meet and inform the ATOVS community of the latest news and developments through its web site currently maintained by the University of Wisconsin CIMSS and the email list server maintained by WMO.
- In particular, more information suitable for education and training will be incorporated onto the web site. A second workshop on radiative transfer modelling of the surface is planned to take place during 2008.
- EUMETSAT and CNES are hosting a workshop on the use of IASI data in Autumn 2007 which will build on the ITWG sponsored advanced sounder workshops.
- The links with international bodies such as the IRC, WMO and CGMS will be maintained and a report of this meeting will be made to forthcoming IRC and CGMS meetings.

ITWG Next Meeting

ITSC-16 in Frade, Brazil, 7-13 May 2008, hosted by the (CPTEC), Brazil

Topics of interest will include extensive evaluation of METOP data, initial assessment of FY-3 data and status of preparations for the NPP launch.

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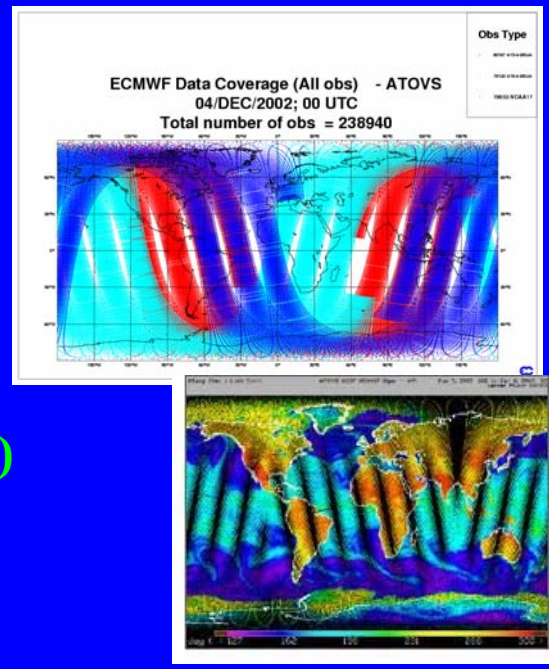

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