

## **OVERSEAS VISIT REPORT - Ian Barton, October 2003**

**Meetings:** CEOS WGCV IVOS Sub-group meeting. Beijing, China 13-14 October  
CEOS WGCV#21 Plenary. Beijing, China 15-17 October  
MAVT-2003 Working Meeting. ESA/ESRIN, Frascati, Italy 20-24 October  
Visit to RSMAS, Uni of Miami, Florida, USA 27-29 October  
**NOTE: MODIS Science Team Meeting October 29-31 postponed at the last minute**

### **CEOS WGCV IVOS Sub-group meeting. Beijing, China 13-14 October**

MEETING NOTES are included as ATTACHMENT A.  
FULL MINUTES OF THIS MEETING WILL BE AVAILABLE IN DUE COURSE

#### Executive Summary:

Ian Barton made two formal presentations to the IVOS meeting. The first was a country report that consisted of a report on the Gulf of Carpentaria SST validation and satellite instrument inter-comparison. The second was a short description of the GHRSSST Pilot Project and details of the latest meeting in September 2003. The report also included a description of the planned GHRSSST Diagnostic Data Sets (DDS). Copies of these presentations are available on request.

Much of the meeting dealt with the planning for a visible instrument inter-calibration as done for the infrared during the Miami2001 experiment. The planning included the holding of a calibration workshop to be hosted by ESA sometime early in October 2004. It was suggested that David Jupp may like to chair a session on hyperspectral imaging and Hyperion. Land application scientists in Australia may find participation in this meeting worthwhile. As further details become available they will be forwarded through the EOC network.

### **CEOS WGCV#21 Plenary Meeting. Beijing, China 15-17 October**

MEETING NOTES are included as ATTACHMENT B.  
AN AGENDA AND FULL MINUTES OF THIS MEETING WILL BE AVAILABLE IN DUE COURSE AT <http://www.wgcvceos.org/>

#### Executive Summary:

The Australian Country Report will be posted on the above web site. The report covered five different aspects of recent activities in Australia; namely

1. Satellite altimeter product validation and the use of GPS systems in measuring sea surface heights.
2. MERIS (on ENVISAT) validation of ocean colour products.
3. SST validation in Australian waters.
4. An update on the SeaHARRE project.
5. Validation of the land surface temperature derived from the AATSR instrument on ENVISAT.

Details of the Australian Country Report were delivered as a Powerpoint presentation. A separate presentation was also made on the status of the GHRSSST Pilot Project. Both presentations are available on request.

GEO vs CEOS issue: Several of the US delegates expressed concern about the Terms of Reference of the GEO working groups in that no mention was made of data quality or of calibration and validation. A proposal was put forward for WGCV to express this concern in their report to Plenary in November. However the Chair said that this could not be done as the GEO ToRs had not yet been agreed. Out of the meeting I talked with the NOAA delegate and said that Australia was concerned about the apparent parallel courses being set by GEO and CEOS, and that in the future it may not be possible for Australia to be represented in both forums. The NOAA delegate said that he would raise this issue in his report back to his agency.

### **MAVT-2003 Working Meeting, ESA/ESRIN, Frascati, Italy, 20-24 October**

Meeting notes are given below as ATTACHMENT C. Note that Arnold Dekker from CLW attended the MERIS component of the meeting and his report will give more details on this aspect of the meeting.

#### **Executive Summary:**

A presentation on the Land Surface Temperature validation provided by Fred Prata of CAR was given. Details of the validation of AATSR-derived SST in Australian waters were also delivered in a Powerpoint presentation.

For the AATSR component, the contributions from the different presenters confirmed the decision to unconditionally release the SST data products to users. The main outcomes from the meeting were summarised during the Friday morning session as follows –

1. MERIS water vapour products: Case-1 waters OK, but Case-2 not good. Jean-Paul Huot states that the sensor is good and shows that cirrus clouds are present everywhere, all the time. He said that it was essential that MERIS data users MUST view the data quality flags in all situations.
2. MERIS water vapour and cloud retrieval algorithms are working well.
3. MERIS land products are OK. There is a need to extend the number of land test sites. There is a need to check out the MGVI product. There is also a need for inter-comparisons with the products from other satellites.
4. AATSR VIS. In the visible channels there is good agreement with MERIS, but both these two sensors are in disagreement with all other sensors. This anomaly needs more investigation.
5. AATSR LST. Algorithms working well and a preliminary product should be released to general users for use and assessment. There are still some concerns about cloud clearing over land. A joint project with MERIS may be beneficial for both instrument teams.
6. AATSR SST.
  - (a) AATSR SST data should be unconditionally released to all users and the release and availability should be widely publicized.
  - (b) MERIS and AATSR synergy should be exploited for cloud clearing over land and ocean. Radiative transfer verification should be attempted using the AATSR dual view.
  - (c) Overlaps between ATSR, ATSR-2 and AATSR should now be reprocessed and validated to confirm the quality of the long term climate data set
  - (d) The AATSR Project supports NRT FTP data distribution.
  - (e) It is recommend MAVT support the DDS approach of GHRSSST.
  - (f) Full reprocessing of AATSR data can begin after next IPF update.
  - (g) MAVT should investigate the possibility of holding an AATSR data user workshop.

A copy of the Powerpoint presentation on the AATSR outcomes by the AATSR validation scientists is available on request.

### **Visit to RSMAS, Uni of Miami, Florida, USA 27-29 October**

Discussions with Dr Peter Minnett and Bob Evans on the MODIS SST processing. Results from the SS0403 Gulf of Carpentaria cruise were passed on to the Miami group for MODIS SST validation.

A meeting was arranged with Sue Walsh and Warner Baringer on MODIS L2ocean processing from both DB and GSFC DAAC data. Following this meeting it is evident that we need to look carefully at the way forward. There seems to be a reasonably close network of people working in this area in the US. They are now aware of what we are trying to do, and a flurry of emails gives some insight into the way to proceed. Sue Walsh said that she was happy for us to work more closely with them to get our system up and running.

Jasmine Nahorniak at Oregon State Uni has written an extensive handbook on how to implement the MODIS processing. Details of how to access this handbook online are included in Attachment D.

ATTACHMENT D contains a selection of emails addressing this issue.

ATTACHMENT A

**CEOS Working Group on Calibration and Validation  
Infrared Visible and Optical Sensors (IVOS) Subgroup**

**MEETING NOTES**

**Beijing Meeting, 13-14 October, 2003**

**Attendees:**

Michael Rast ESA/ESTEC (Chair)  
Hiroshi Murakami, NASDA  
Ian Barton, CSIRO  
Steve Delwart, ESA/ESTEC  
James Joe, NOAA  
Jim Shiue, NASA  
Jerry Fraser, NIST  
Nigel Fox, NPL  
David Meyer, USGS  
HeGuang Liu, CSSAR, CSA  
Xue-Fie Wang, "Virginia", Meeting secretariat.  
Wang CSSAR - Technical support  
Huang Xiaoxian SITP x 2                      Cal of FY-3 Optical SITP

**AGENDA**

1. Welcome and introduction
2. Meeting objectives
3. Minutes and actions from 12<sup>th</sup> meeting
4. Recommendations to the 20<sup>th</sup> WGCV meeting in Hobart 2003.
5. Agency/country reports
6. Status reports on currently operated optical satellite sensors
7. Large-scale optical sensor calibration inter-comparison, a) Radiance/reflectance products, b) Calibration approaches, c) Vicarious calibration sites and the available data.
8. Planning of IVOS sensor inter-calibration workshop in 2004
9. IVOS report to CEOS WGCV 2003.
10. IVOS membership
11. Any other business
12. Close

**He Guang Liu:**

Welcomed all to Beijing. Lunch at 1:00 pm. Also dinner tonight. Office in Room 40103.

**Michael Rast:**

Welcome and introduction.

Showed IVOS terms of reference. A lot of sensors are missing from the CEOS Handbook. Identify test sites – the old "Dossier".

Objectives of Meeting.

- to review country activities
- to plan IVOS large scale optical sensor inter-calibration and an associated conference/workshop in 2004
- to recommend use of Thullier solar spectrum as a standard

- to discuss cal-val newsletter
- to investigate the state of the dossier on the in situ sensor network

Report on last IVOS meeting:

Three recommendations were presented to WGCV –

- integration of activities over sites
- development of mission planning tool as all satellites have repeat cycles
- to hold a satellite sensor inter-calibration workshop

Action items are listed in the meeting minutes –

- S Delwart to find out about diffuser testing procedures
- Rast to contact NIST on the same issue
- Mutlow to contact B Kerridge re same issue on chemistry sensors
- Thullier to provide info on SBUV cal.
- N. Fox to formulate a reference for the traceability for CEOS glossary re ITS 90.
- N. Fox formulate use of transfer radiometers
- All IVOS members to advise on scope of w/s
- H. Schwartzer to provide coordinates on Tunisia test site, and to find out if MOS detectors were still be manufactured or were available.
- H. S. s to investigate heritage of tungsten cal lamps for MOS.
- Rast to invite reps from different agencies to next IVOS meeting.

Two recommendations from last meeting – need to re-work these plus a third -

1. Use of Thullier's spectrum as a standard
2. Implement a network of global automated and instrumented test sites for IVOS sensors.
3. Establish a document of Protocols for cal/val.

## COUNTRY REPORTS

**Dave Meyer, USGS:** LDCM still under doubt. NASA now looking for international partners to take the program forward.

**Gerry Fraser, NIST:** Described work on aperture comparisons. Strategic plan for US Climate Change Program. NIST to provide stewardship for the observing system.

**Nigel Fox, NPL:** Described a new philosophy for standards of radiance using black body sources at high temperatures instead of lamps. Also described several research projects. NPL were involved in GERB calibration. GERB is now flying on MSG.

**James Yoe, NOAA:** Described some work which will also be presented at the WGCV meeting on Friday. Showed comparison between AIRS, RAOB, and GPS measurements of T and WV.

For NPOESS cal/val is a joint responsibility of contractor and government.

**Hiroshi Murakami JAXA:** NASDA changes name to JAXA – Japan Aerospace Exploration Agency. GLI cal/val - for ocean colour use on-board, vical by MOBY, and SeaWiFS nLw.

Use Alaska cal/val site near Barrow. Use desert sites as well

Ishigaki buoy was cancelled – so use regular ships for ocean colour validation.

ALOS, PALSAR, AVNIR-II to be launched in he coming year.

Full status report of GLI will be given in WGCV meeting.

Cross calibration over Alaska snow fields near Barrow, Alaska. Initial check-up of GLI performance against other satellites. December is end of GLI cal/val and after that a general data release will be made.

Alaska site is 2x2 km site, but there is also a macro site of 6x6 km used for uniformity check.

Polar regions good for semi-simultaneous opportunities and minimum effects of atmosphere

Showed some very interesting comparisons. SeaWiFS seemed to be the best of all.

**GLI Cal Status:** 36-channel instrument. Showed overview of mission plus details of the channels. Operational cal/val phase April 14 to Dec 14. Stated ground observations and match-up analysis. Pixel alignment has been improved – used to be out by 2-3 pixels in some cases. JAXA have also developed a system for reducing the stripe noise/effect. Mirror side differences are also under investigation.

Listed all the vical sources for vical –

- Moby used with Denis Clark
- SeaWiFS nLw binned data for comparison.
- On-board cal – drifts may be due to diffuser degradation and not the detectors.
- Comparison with Reynolds SST
- SeaWiFS Chl-a

**Huang Xiaoxian, SITP:** China Moderate Resolution Imaging Scanning Radiometer - CMRISR: 12 bits, +/- 55 degree scan, 2048 pixels 19 vis/NIR channels, 1 thermal  
Has an on-orbit calibrator.

**Michael Rast, ESA/ESTEC:** ESA's activities. Will focus on MSG calibration. MERIS L2 operational land products. Do a MERIS NDVI as well. Sun glint in east of swath. Showed imagery of Etna plume of SO<sub>2</sub> using Sciamachy.

ESA have 3 related programs ; earth exploration, earth watch, and technology/instrument development.

Earth explorer approved missions (4). –

- GOCE gravity mission,
- wind scat,
- SMOS, and
- Cryosat.

MSG Cal philosophy - dark signal character, absolute radiance source, relative spatial source. All these are based on MERIS calibration.

Also working on 3 SEVERI reflective channels on MSG (launched Aug 2002).

**Steve Delwart, ESA/ESTEC:** MERIS cal/val

Radiometric cal – 1 \_ years available. Use of a solar diffuser. Instrument gain over year only changed by 1%. Bands 1 and 2 have minor degradation. Slightly different in each camera. Some errors may be due to diffuser “speckle”.

Calibration methods are done at CNES for Polder, Vegetation 1 and 2, and SeawiFS.

**Junwu Tang, Professor, Ocean sat institute ???:**

HY-1 satellite Chinese ocean colour satellite. 3-day repeat. On-board cal. Vis – None: IR – a BB 1.1 km nadir resolution. 1024 pixels +/- 35 degrees, 10 bits, one gain

Bands like SeaWiFS plus a 250m resolution 12 bits CCD imager

1<sup>st</sup> image 14 days after launch

Compare with SeaWiFS products in ocean near Hainan Island.

**Ground facilities for HY-1 cal.**

Instrumentation –

- ASD spectrometer
- In-water profiling method. Satalantic free-fall system

Inherent optical properties – use a Hobilabs HS-6 and a GBC spectrometer

Pigments - used a Fluorometer, HPLC

Atmospheric correction. - use radiative transfer models.

Initial calibration cruise in Case-I waters near Hainan (Chinese Hawaii!!!).

**AGENDA ITEM 7.** Large-scale optical sensor calibration inter-comparison.

- a) Radiometric/reflectance products

- b) Calibration approaches
- c) Vicarious calibration sites and the available data.

Looking for a land activity – inter-comparison of satellite sensors, or a ground comparison of instruments, or both. Gave Miami-2001 as an example. Need Aims and Objectives, outcomes, and a realistic budget. Some idea of target satellites, ground instruments, and participants required.

**Rast** has put together the start of such a document.

AIM: Aimed at consistency of satellite products over land used for climate research

GOAL: To inter-compare satellite and in situ instruments.

THE EXPERIMENT: Initially it is proposed to inter-compare at sensor radiances between currently deployed optical imaging space-borne sensors over a single spatially and spectrally uniform target area. An integral component of this experiment is the simultaneous deployment of all in-situ based instruments used to characterize target areas. This necessitates an initial agreement on the spectral range, solar irradiance profile, and the treatment of atmospheric effects.

OUTCOMES: Consistent data sets for climate change etc. Good for inter-government agencies to make informed decisions.

DELIVERABLES: Product data base etc.

NEXT STEPS: One or two lead agencies to take over planning the details.

**Michael Rast:** Concern expressed about the upcoming joint WGCV/ISPRS meeting in December. Looks like input from WGCV will be limited and is concerned about outcomes of the meeting.

Concern also about the development of the WTF - the WGISS Test Facility. USGS is involved.

**Workshop** over 3 days in first week of October 2004 to be organised by ESA. Dates Monday 4 to Friday 8 October.

**Possible sessions and chairs/organisers.**

D Jupp: Hyperspectral imaging calibration and inter-comparison

Carol Brugghe: Methodology

Craig Donlon: Infrared measurements over the sea

Simon Hook: LST

Carol Johnson: Requirements for improvement of pre-launch calibration.

Kurt Thome: Post-launch satellite sensor cal over land.

Phil Teillet: Vical techniques

Hugh Kieffer: Celestial calibration targets

Didier Tanre: Radiative transfer methods

**Rast:** Re-visited recommendations.

1. Rec. on solar irradiance
2. Network of test sites.
3. Define key factors in cal/val protocols. Part of ISPRS/WGCV task force.
4. In-depth study of solar diffusers.
- 5.

**IVOS Membership:**

Action item for all. Looking for an Indian contact back on IVOS.

**AOB:** Barton made a presentation on the GHRSSST Project including a summary of the recent meeting in Pasadena, CA, USA.

**Next IVOS Meeting** would be held with the planned Sensor Inter-calibration Workshop in October 2004.

**Meeting closed at 1730, Tuesday 14 October.**

ATTACHMENT B

**CEOS Working Group on Calibration and Validation  
21st Plenary Meeting**

**MEETING NOTES**

**Beijing Meeting, 2003**

**Attendees:**

Yves-Louis Desnos (Chair), ESA/ESRIN  
Marie-Claire Robinson, Secretariat, UK  
Stephen Ungar, NASA (WGCV Chair-elect)  
Michael Rast, IVOS SG Chair, ESA/ESTEC  
Ernest Hilsenrath, Chair Atmospheric Chemistry SG, NASA  
Masanobu Shimada, SAR SG Chair, JAXA  
Jeff Morisette, LPV SG Chair, NASA  
Jan-Peter Muller, Chair TM SG, University of London, UK  
Ian Barton, CSIRO  
Gordon Keyte, QinetiQ, UK  
James Yoe, NOAA  
Jim Shiue, Microwave SG Chair, NASA  
Jerry Fraser, NIST  
Nigel Fox, NPL  
David Meyer, USGS  
HeGuang Liu, CSSAR, CSA  
Xue-Fie Wang, "Virginia", Meeting secretariat.  
Xiaoxian Huang SITP x 2 Cal of FY-3 Optical

**Welcome from Ministry of Science:** Announced successful launch of manned flight at 0900 this morning

**Welcome Address:** Li, De-ren, CSSAR Head.

Listed all the Chinese satellites launched for meteorology and EO.

FY-1D launched 2002 - Ocean colour bands + 3.7, 11, 12 micron IR for SST

FY-2B Geo with enhanced capability (NB: 2,4,6 mean a geo; 1,3,5 a polar orbiter)

HY-1 - a marine satellite for ocean colour and SST. 1.1 km and 1600 swath.

**New Missions:** HY-2, Met satellite FY-3, CBERS-2

High performance small sat.

Disaster and environment monitoring small satellite.

**AGENDA was approved**

**Apologies from:** Phil Teillet, Evert Attema, Manuel Martin-Neira, Ian Dowman, Giuseppe Zibordi, and Lasse Petersen.

**Yves-Louis Desnos:** Chairman's report .

Achievements in 2002-2003. A new Web site has been established. A new newsletter that is available on the www site. A joint WGCV/WGISS demo is set up for CEOS Plenary. A brief report was presented on the Hobart meeting.

**Marie-Claire Robinson:** Secretariat report. Main effort on WWW site and the WGCV 3.1 work plan. A new WGCV Newsletter was produced. An action item on all WGCV members is to check out the web site, and look at the newsletter.

**Action Items from last meeting**

- 17.10 – More a discussion item than an action item. Can keep to next workshop - but after that should be deleted if not completed.
- 18-13 – Complete
- 19-01 – Complete but Open. Provide case studies for www site.
- 19-05 – Complete. Education material
- 19-08 – Closed
- 20-01 – Closed New www site on line.
- 20-02 – Closed
- 20-03 – Closed. New plan formulated and distributed with the WGCV#21 papers
- 20-04 – Open – to be discussed at WGCV 21
- 20-05
- 20-06 Closed. Contacted but no response
- 20-07 – To be reported at WGCV#21
- 20-08 – ditto
- 20-09 – Availability of MERIS data – to be discussed at WGCV#21
- 20-10 – Closed
- 20-11 – Closed
- 20-12 – Closed
- 20-13 – Open: awaiting review and up-dated version before distribution.
- 20-14 – Closed: covered in the newsletter.
- 20-15 – Closed
- 20-16 – Closed. Demo will occur.
- 20-17 – Closed: James Yoe new rep for NOAA.
- 20-18 – Ongoing activity
- 20-19 – Closed
- 20-20 – Closed
- 20-21 – To be discussed at WGCV#21
- 20-22 – Closed
- 20-23 – Closed
- 20-24 – Closed
- 20-25 – Closed
- 20-26 – To be discussed at WGCV#21

**James Yoe:** CEOS Chair Up-date from NOAA. Estimate 100 new EO satellites in the next 10m years.

4 goals for CEOS in 2002-03

1. Focus on data use
2. Follow up on WSSD
3. Focus on IGOS Themes
4. Harmonization among different EO bodies.

**Gordon Keyte:** IGOS and WGCV. Traced the history of IGOS-P that was formed in 1997.

**Ernest Hilsenrath:** Report to WGCV Plenary from the Atmospheric Chemistry Sub-Group. Several recommendations presented – all asking for extra funding.

**Michael Rast:** Report to WGCV Plenary from the IVOS Sub-Group.

**Jeff Morisette:** Report on Land Product Validation Sub-group.

**Jan-Peter Muller:** Report on Terrain Mapping Sub-group. Put forward 3 recommendations.

1. For space agencies to use GTOPO30 which incorporates edited SRTM DEM data as soon as possible.
2. Space-borne DEM data producers should provide web-based services
3. TMSG requests funding to set up a WGISS TF

**Yves-Louis Desnos:** Presented the Microwave Sub-group report for Manuel Martin-Neira.

**Masanobu Shimada:** Gave SAR Sub-group report to WGCV 21<sup>st</sup> Plenary. A recommendation to space agencies to adopt the Amazon rain forest as a standard target for SAR calibration was tabled.

**Nigel Fox:** Discussed joint WGCV/ISPRS Task Force. A meeting planned by ISPRS for Stennis Space Center in December was arranged without input from WGCV. Concern was expressed about the agenda and aims of the workshop.

**Jeff Morisette:** WTF - WGISS test facility on LPV sites. Prototype was available in May 2003. Objectives are to establish links between test sites and data archives, to foster validation efforts, and to encourage collaboration between validation investigators and existing science networks.

**Tang NSOAC:**

HY-1 is China's first marine remote sensing satellite launched on May 15 2002. Altitude is 798 Km in a quasi sun-synchronous orbit to get coverage at 1030 am instead of 9:00.

HY-1 has 2 instruments

1. Nadir viewing with spatial resolution of 1.1 km, a 1500 km swath. HY-1 has SeaWiFS bands + two split window IR channels.
2. CCD imager in 4 bands with push-broom detectors. Has a spatial resolution of 250m, 2048 pixels of 12 bits, using only a single gain.

Receivers: SeaSpace antenna in Hainan and in centre China.

HY-1 has 80MB memory so it can get data from parts of globe not covered by their receiving stations.

## **FRIDAY 17 OCTOBER**

### **Review of Recommendations**

**Michael Rast, IVOS SG:**

- R1. Use of Thullier's solar spectrum. Approved for delivery at CEOS Plenary.
- R2. Support for studies of on-board solar diffusers. Agreed.

**Ernest Hilsenrath, AC SG:**

An earlier recommendation called for the establishment of two ozone stations, one in South America, and the second in Africa, at a cost of \$300K per year per station. After several iterations NOAA and WMO has addressed the issue and the AC SG considers this matter closed.

- R1. Reinstate and maintain high latitude atmospheric chemistry stations.

**Masanobu Shimada, SAR SG:**

- R1. SAR operators should use the Amazon rain forest as a standard target for SAR calibration.

**Jeff Morisette, LPV SG:**

- R1. A recommendation to express concern on the lack of cal/val in GEO documentation was not approved. It was held over till WGCV#22 when all the GEO documentation is available.
- R2. LPV recommends that the WTF (WGCV/WGISS Test Facility) be continued through to 2006.

**Jan-Peter Muller, TM SG:**

- R1. Requests support to set up WTF as a core test facility. Combine with LPV R2 above. Approved.
- R2. Recommend that satellite data providers set up web-based methods for the reporting and display of errors and concerns with their satellite data quality. Needs more work.
- R3. Recommend the use of newly developed DEMs to replace existing data sets.

## **COUNTRY REPORTS**

### **Australia, Ian Barton:**

Described 5 different activities. Text available on the WGCV web site. A Powerpoint presentation is available on request.

### **China, ???:** 4 topics presented.

1. SZ-4 Chinese un-manned satellite with microwave sensor Launched Dec29 2002  
Radiometer 6.6 13.9, 19.35, 23.8, 37 GHz. Restricted to +/- 40 latitudes.
2. FY-3 Scheduled 2006. 11 instruments including 3 microwave for Humidity, Temperature, and microwave radiation imager.
3. Moon exploration : Multiband radiometer 3,7.8,19.35, 37 GHz. To investigate the surface layer of the moon.
4. China imaging altimeter( CIALT) SPIE vol4894, 2003.

### **China, Xiaoxian Huang, SITP:**

Radiation calibration activity of optical remote sensors at SITP. Cal following sensors - SRM scanning radiometers on FY-1 and FY-2, CMODIS,COCTS, and SRM CMRISR.

### **ESA, Yves-Louis Desnos:**

A detailed ESA report on all EO activities is on the WGCV web site.

### **NPL, Nigel Fox:**

Full report on the web site. A new cal route adopted at NPL.

### **NASA, Stephen Ungar:**

Future NASA missions are –

**Aura.** The 3<sup>rd</sup> of Terra and Aqua to be launched (late) in 2004. Basically an atmospheric chemistry satellite. Has HIRDLS, OMI, MLS, TES-FTIR. A full validation program is planned.

**GPM.** Global precipitation mission.

**NPOESS.** The operational met system.

**EO-1.** Showed Hyperion data examples.

**SpectraSat.** An imaging spectrometer.

### **JAXA, Masanobu Shimada:**

ADEOS-2 launched December 2002. Data distributed to users in December 2003.

ALOS to be launched September 10, 2004

JAXA have built a Polarimetric Active Radar Calibrator for ALOS SAR calibration.

JAXA are data mining old JERS data. They have a good global data for 6 years ago, and would be happy to distribute data to international users. Planning to do polarised pairs for global interferometry for 92 days every year and a half.

### **NIST, Gerry Fraser.**

New capabilities: HACR 2. Should reduce uncertainties by a factor of two.

SIRCUS. Tunable laser 325 nm to 18 microns.

API, a highly accurate absolute radiometer.

These capabilities will mean that pyrometers, etc. can be calibrated to 0.1%.

Still doing MOBY calibrations.

### **NOAA, Jim Yoe:**

Cal/val at NOAA/NESDIS. To ensure the functionality of present and future systems - NOAA and NPOESS.

**UK, Gordon Keyte:**

ESA has responsibility for UK instruments – but there are cal/val activities being undertaken in the UK. These are mainly done at NERC universities and departments.

**USGS, Dave Meyer:**

Walked us through the LANDSAT-5 mission with the importance of vical being stressed. LANDSAT-7 Turned off for some time. Will start to receive and analyse data next month. Data should be available soon. LDCM – single bid rejected by NASA.

**Review of Action Items:**

Completed. A full list will be supplied soon.

**Date and Place of Next Meeting:**

Washington DC area, during June 2004.

**Meeting closed at 1800.**

ATTACHMENT C

**MAVT-2003 Meeting Notes**

**ESA/ESRIN 20-24 October 2003.**

**Introduction: Pascale Lecomte**

We have a good satellite with two fantastic instruments – AATSR and MERIS.

**ENVISAT Status: Henri Laur**

Showed clear image of British Isles from MERIS. Also some images of French Riviera with fire scars.

There have been problems with the ground segment – especially with MERIS.

For MERIS and AATSR 2/3 of the data go to Kiruna and 1/3 to Svalbard.

Now using Artemis for high bit rate data. This allows more full resolution MERIS data to be available. Now up to 90 % of full resolution data now available.

MERIS data released for all users in mid-2003. Now up to 500 products per month.

AATSR is a new product for release. Details will be provided during the workshop data analysis..

Producing a CD-ROM of MERIS global data.

AATSR and MERIS toolbox has programs for data analysis. ESRIN hope to have an on-line data ordering system in place soon.

ENVISAT web page has a PI portal. <http://eopi.esa.int>

Questions asked about an NRT service for AATSR L1B data as was provided for ATSR-2. ESA took these comments on board and would look to see if feasible. Problem is that there are other instrument data that would also need to be included.

**Status of AATSR and MERIS – Philippe Goryl**

Showed lots of images from both satellites - L1 and L2 data.

Suite included a global SST from the Meteo product.

AATSR working well. Cooler OK at 70 K. The scan mirror, BBs, all detectors are all working OK. Occasional scan mirror jitter.

**MAVT Validation Overview – Paul Snoeij**

Gave CEOS definitions on Calibration and Validation. Talked about cal/val requirements for ESA instruments.

**MERIS Match-up distribution and IPF up-dates - Carsten Brockmann**

Overview of data production and data distribution paths to Cal/Val team.

IPF is integrated processing facility. Match-up data distribution. Showed algal boom in Baltic Sea.

IPF Version 3.55 Nov 2002

IPF Version 4.06 Jun 2003

Version 6.3 of the Prototype in August 2003.

#### **Water vapour validation - Peter Albert**

Uses MERIS data.

1. Use the ARM SGP site microwave radiometer. A good agreement over land, RMSE=0.2 cm WV.
2. Also compared with radiosondes around Europe. Bias 0.12, rmse = 0.25 cm.
3. 3. WV above clouds. Could get cloud top pressure to 70 hPa.

CONCLUSIONS: MERIS WV is good.

#### **Validation of MERIS cloud top pressure - Rene Preusker**

Effective cloud top height. Comparisons using sondes, MODIS, and ARM radar

1. With sondes MERIS heights are too low.
2. With MODIS sees different clouds - MODIS uses the 12 micron temperature. MERIS cloud estimates are lower than MODIS.
3. Compare with ARM cloud radar.

#### **Reprocessing Plans: Pascale Lecomte**

Level 0 consolidation by Feb 2004. Re-processing Feb to June 2004. Data dissemination under way June 2004.

MERIS April 29, 2002 5 orbit 846

AATSR July 25, 2002 8 orbit 2094 (For Vis and IR data)

Some discussion on whether the IR products should be reprocessed from May 2002.

#### **FRIDAY MEETING SUMMARIES**

7. MERIS water vapour products: Case-1 waters OK, but Case-2 not good. Jean-Paul Huot states that the sensor is good and shows that cirrus clouds are present everywhere, all the time. He said that it was essential that MERIS data users MUST view the data quality flags in all situations.
8. MERIS water vapour and cloud retrieval algorithms are working well.
9. MERIS land products are OK. There is a need to extend the number of land test sites. There is a need to check out the MGVI product. There is also a need for inter-comparisons with the products from other satellites.
10. AATSR VIS. In the visible channels there is good agreement with MERIS, but both these two sensors are in disagreement with all other sensors. This anomaly needs more investigation.
11. AATSR LST. Algorithms working well and a preliminary product should be released to general users for use and assessment. There are still some concerns about cloud clearing over land. A joint project with MERIS may be beneficial for both instrument teams.
12. AATSR SST.
  - (a) AATSR SST data should be unconditionally released to all users and the release and availability should be widely publicized.
  - (b) MERIS and AATSR synergy should be exploited for cloud clearing over land and ocean. Radiative transfer verification using AATSR dual view.
  - (c) Cross-overs between ATSR, ATSR-2 and AATSR should now be reprocessed and validated to confirm quality of long term climate data set
  - (d) Support NRT FTP data distribution.
  - (e) Recommend MAVT support DDS approach of GHRSSST.
  - (f) Full reprocessing of AATSR data can begin after next IPF update.
  - (g) MAVT should investigate possibility of AATSR data user workshop.

## ATTACHMENT D

Emails from Sue Walsh related to MODIS processing:

Ian,

You can download the NASA direct broadcast level 0 to L1b code from the direct broadcast site:

[http://directreadout.gsfc.nasa.gov/download\\_technology/db\\_software\\_info.cfm?software=GSFC-DAAC&version=2.2](http://directreadout.gsfc.nasa.gov/download_technology/db_software_info.cfm?software=GSFC-DAAC&version=2.2)

This would mean you'd have two processing streams with two versions of L1a. Jasmine will let us know if there's a way to go from imapp to PGE02. Sue

----- Forwarded message -----

Date: Tue, 28 Oct 2003 11:04:49 -0800 (PST)

From: Jasmine Nahorniak <jasmine@coas.oregonstate.edu>

To: swalsh@rsmas.miami.edu

Subject: Re: code documentation

Sue,

I started reading through your comments and realized that you may not have known about the NASA direct broadcast level 0 to 1b code. This is the alternative to using IMAPP. It makes MOD\_PR01, MOD\_PR02 and MOD\_PR03, and outputs all data in HDF-EOS format. This is what we use. It is harder to install than IMAPP since it requires the HDF-EOS toolkit. In your email about Ian's problem you stated that "he needs to use imapp ...". Did you really mean that he has to use IMAPP, or just that he has to be able to create level 1b files?

I've sent an email to Liam Gumley (IMAPP) asking if there's an alternative to the Russian HDF to HDF-EOS converter.

Jas.

Ian,

The correct link for the NASA L0 to L1b code is:

[http://directreadout.gsfc.nasa.gov/download\\_technology/db\\_software\\_info.cfm?software=GSFC-DAAC&version=2.3](http://directreadout.gsfc.nasa.gov/download_technology/db_software_info.cfm?software=GSFC-DAAC&version=2.3)

It's the 2nd to last entry in the table on the direct broadcast software page.

Liam Gumley says there is an HDF2EOS program from:

[http://laits.gmu.edu/Download/Dn\\_Tools.htm](http://laits.gmu.edu/Download/Dn_Tools.htm)

But as far as he knows, no one's tried it's output in PGE02. I've asked him if he has a sample file, and he responded with a question, but I'm not sure if he has one I can use. If not, I'll try to grab the program and test it here. Sue