

Envisat Validation Workshop

9-13 December 2002 ESRIN, Frascati, Italy

Contents

1. Atmospheric Chemistry Validation
 - MIPAS
 - GOMOS
 - SCIAMACHY
 - Data Assimilation and Satellite Intercomparison
 - Ground-based Techniques
 - GOMOS Validation
 - MIPAS Validation
 - SCIAMACHY Validation
 - Balloon and Aircraft Campaigns
 - Odin Session
2. MERIS Validation
 - Level 2 Algorithms Verification
 - Radiative Transfer Code Intercomparison
 - Water Vapour and Cloud
 - Vegetation
 - Case 1 Water Products Validation
 - Case 2 Water Products Validation
 - Early Results
3. AATSR Validation
4. Altimetry
 - Approach and Objections - RA2, MWR, Doris Altimetry
 - Absolute Calibration Altimetry
 - Cross-Calibration and Product Validation
5. ASAR
 - Instrument and Processor Performance
 - Product Quality Update
 - Wave Mode Validation and Summary

1. Atmospheric Chemistry Validation

• MIPAS

MIPAS Instrument and Level 1 Verifications Using Level 2 Retrieval Code

P. Raspollini, D. Alpaslan, B. Carli et al.

MIPAS Level 2 Processor Performance and Verification

M. Ridolfi, D. Alpaslan, B. Carli et al.

Internal Consistency of MIPAS Level 2 Products

P. Raspollini, D. Alpaslan, B. Carli et al.

A Spectroscopic Database for MIPAS

J.-M. Flaud, C. Piccolo & B. Carli

MIPAS Observations of Clouds and their Effects on Level 2 Trace Gas Products

J.J. Remedios & R. Spang

Non-LTE Studies for the Validation of MIPAS L2 Products

M. López-Puertas, Th. von Clarmann, A. Dudhia et al.

• GOMOS

GOMOS Calibration on Envisat – Status on December 2002

G. Barrot, J.-L. Bertaux, R. Fraise et al.

GOMOS Validation Review, December 2002

O. Fanton d'Andon

Limb and Straylight Contribution to GOMOS Signal

A. Mangin, O. Fanton D'Andon, J.-L. Bertaux & A. Hauchecorne

Validation of GOMOS Ozone Profiles Using NDSC Lidar: Statistical Comparisons

P. Keckhut, S. Marchand, A. Hauchecorne et al.

• SCIAMACHY

First Verification of SCIAMACHY's Absorbing Aerosol Index Product

M. de Graaf & P. Stammes

Verification of SCIAMACHY's Reflectance over the Sahara

J.R. Acarreta & P. Stammes

Verification of SCIAMACHY's Polarisation Correction over the Sahara Desert

L.G. Tilstra, J.R. Acarreta, J.M. Krijger & P. Stammes

Current Status of SCIAMACHY Polarisation Measurements

J.M. Krijger & P. Stammes

Verification of SCIAMACHY Level 1 and 2 Near-IR NADIR Data Products by WFM-DOAS Analysis

M. Buchwitz, S. Noël, H. Bovensmann & J.P. Burrows

Calibration of SCIAMACHY In-Flight Measured Irradiances and Radiances – First Results of Level 1 Validation

J. Skupin, S. Noël, M.W. Wuttke, H. Bovensmann & J.P. Burrows

DOAS UV/VIS Minor Trace Gases from SCIAMACHY

R. de Beek, A. Richter & J.P. Burrows

• Data Assimilation and Satellite Intercomparison

ACVT Session on Validation by Model Assimilation and/or Satellite Intercomparison - Brief Overview

C. Zehner

Monitoring of Near-Real-Time SCIAMACHY, MIPAS, and GOMOS Data at ECMWF

A. Dethof

Comparison of SCIAMACHY Near-Real-Time Ozone Columns with GOME Assimilated Ozone

H. Eskes, J.F. Meirink & A. Piters

Evaluation of Envisat Data Using a NWP Assimilation System: A Vortex-Centred View

W.A. Lahoz, S. Migliorini, R. Bannister, R. Brugge & A. O'Neill

Monitoring of SCIAMACHY Total Column Ozone Using the DAO Ozone Data Assimilation System

N. Winslow, I. Stajner & R. Rood

Validation of ENVISAT Ozone Products Through Assimilation in a CTM; First Results Obtained with GOMOS

B. Théodore, M. Guirlet, A. Hauchecorne, O. Hembise & A. Mangin

Verification of SCIAMACHY Near-Real-Time and Meteo Level-2 Products: O₃ and NO₂ Columns, Clouds, Aerosols and Geolocation

J.F. Meirink, V. Soebijanta, A. Piters et al.

4D-VAR Chemical Data Assimilation of ENVISAT Chemical Products (BASCOE): Validation Support Issues

D. Fonteyn, S. Bonjean, S. Chabrilat, F. Daerden & Q. Errera

Initial comparison of SAGE III Data with GOMOS and SCIAMACHY

W.P. Chu, C.L. Trepte & G. Taha

Validation of Envisat Products Using POAM III O₃, NO₂, H₂O and O₂ Profiles

A. Bazureau & F. Goutail

Validation of ENVISAT trace gas data products by comparison with GOME / ERS-2 and other satellite sensors

A. Bracher, M. Weber, K. Bramstedt et al.

Verification of CO, CH₄, and CO₂ Retrieved Total Columns SCIAMACHY Near-Infrared Channels

A.G. Straume, H. Schrijver & A.N. Maurellis et al.

- **Ground-based Techniques**

The Preliminary Validation of GOMOS, MIPAS and SCIAMACHY by Ground-based Instruments and Soundings

R.M. Koopman, T. Blumenstock, J.P. Burrows et al.

Envisat Cal/Val Campaign Database

T. Kroghes, A.F. Vik & R. Koopman

- **GOMOS Validation**

Air-Density and Temperature Profiles

S. Marchand, P. Keckhut, K.H. Fricke et al.

Analysis of GOMOS Ozone Profiles Compared to GMBCD Datasets (bright/dark, star magnitude, star temperature)

Y. Meijer, T. Blumenstock, P. Keckhut et al.

Early Validation of GOMOS Limb Products Altitude Registration by Backscatter Lidar Using Temperature and Density Profiles

U. Blum, K.H. Fricke, S.R. Pal & R. Berman

- **MIPAS Validation**

Validation of MIPAS Temperature, Density and Water Vapour Profiles

H. Schets, D. De Muer, K.H. Fricke, U. Blum, V. Cuomo & G. Pappalardo

Comparisons of MIPAS O₃ Profiles with Ground-based Measurements

T. Blumenstock, A. Griesfeller, F. Hase et al.

- **SCIAMACHY Validation**

Ground-based Comparisons of Early SCIAMACHY O₃ and NO₂ Columns

J.-C. Lambert, J. Granville, M. Allaart et al.

Comparison of SCIAMACHY Other Products (AODs 126, 174, 427)

R.M.A. Timmermans, D.V. Ionov, J.F. Meirink et al.

Comparison of Scientific SCIAMACHY Products with Ground-based Measurements

K. Bramstedt, M. Buchwitz, U. Blum et al.

Validation of Envisat Level-2 Products Related to Lower Atmosphere O₃ and NO_y Chemistry by a FTIR Quasi-Global Network (AOID126)

M. De Mazière, T. Coosemans, B. Barret et al.

Envisat Data Validation with Ground-based Differential Absorption Raman Lidar (DIAL) (AOID153)

S.R. Pal, D.I. Wardle, H. Fast et al.

Coordinated Ground-based Validation of Envisat Atmospheric Chemistry with NDSC Network Data: Commissioning Phase Report (AOID158)

J.-C. Lambert, V. Soebijanta, Y. Orsolini et al.

Intercomparison of the Total Ozone Observations at Athens, Greece (AOID174)

C. Varotsos, C. Tzannis & J. Christodoulakis

Validation of MIPAS and SCIAMACHY Data by Ground-based Spectroscopy at Kiruna, Sweden, and Izaña, Tenerife Island (AOID191)

T. Blumenstock, A. Griesfeller, F. Hase et al.

The Setup and the Performances of L'Aquila Raman Lidar and Standard PTU and PTO3 Balloon Soundings for Envisat Validation (AOID206)

V. Rizi, M. Iarlori, G. Rocci et al.

Early Validation of Vertical Profiles from the Envisat Atmospheric Instruments GOMOS and MIPAS with the University of Bonn Lidar at the Esrange in July and August 2002 (AOID222)

K.H. Fricke & U. Blum

Validation of GOMOS, MIPAS, SCIAMACHY Ozone and Temperature Measurements by Ground-based Measurements at UCCLE (Belgium)(AOID300)

H. Schets & D. De Muer

SCIAMACHY Validation Using Ground-based DOAS Measurements of the University of Bremen Bredom Network (AOID331)

A. Richter, D. Adukpo, S. Fletkau et al.

Ground-based FTIR, Ozonesonde and Lidar Measurements for the Validation of SCIAMACHY (AOID331)

A. Schulz, T. Warneke, J. Notholt et al.

Validation of Envisat SCIAMACHY Atmospheric Trace Gases Measurements with the Russian Ground-based Monitoring Network (AOID427)

Yu.M. Timofeyev, D.V. Ionov, M.V. Makarova et al.

Preliminary Assessment of the Accuracy of the GOMOS Level 2 Ozone Product (AOID429)

T. Suortti, E. Kyrö, T. Turunen & A. Karpetchko

SCIAMACHY Validation of NO₂ Total Column by Means of Ground-based DOAS Measurements at Mt. Cimone (44N, 11E) and Stara Zagora (42N, 25E) Stations (AOID1103)

A. Petritoli, G. Giovanelli, I. Kostadinov et al.

Comparison of GOMOS and MIPAS Ozone Profiles with Lidar Measurements from Alomar (69.28°N, 16.01°E) (AOID9079)

K. Stebel, G.H. Hansen, Y. Orsolini & K. Edvardsen

Lidar and Radiosonde Measurements Campaign for the Validation of Envisat Atmospheric Products (AOID9083)

V. Cuomo, G. Pappalardo, A. Amodeo, C. Cornacchia, L. Mona & M. Pandolfi

Validation of Envisat Measurements by Ground-based Nighttime Lidar Soundings (AOID9100)

F. Congeduti, F. Fierli, P. D'Auliero & C. Medaglia

• Balloon and Aircraft Campaigns

The Validation of the Envisat Chemistry Instruments by Use of Stratospheric Balloons and Aircraft

P. Wursteisen

Envisat Validation with MIPAS - B

H. Oelhaf, F. Friedl-Vallon, A. Kleinert et al.

Validation of GOMOS Products Using SALOMON Algorithms and Data

J.-B. Renard, G. Berthet, M. Chartier & C. Robert

SPIRALE Experiment / Preliminary Results of the Balloon Flight, 2 Oct. 2002

G. Moreau, C. Robert, F. Goffinon, M. Pirre & C. Camy-Peyret

The MANTRA 2002 Balloon Flight from Vanscoy, Canada

K. Strong, D. Barton, P. Bernath et al.

Validation of GOMOS H₂O Data Product with Balloonborne Laser and Frost-Point Hydrometers

G. Durry, J. Ovarlez & I. Pouchet

SCIAMACHY Solar Irradiance Validation Using Radiometric Calibration of Balloonborne, Airborne and Ground-based Spectrometers

W. Gurlit, K. Gerilowski, H. Krause & J.P. Burrows

Validation of SCIAMACHY Water Vapor and Methane Profiles by Balloonborne In-Situ Measurements with the "Child" Spectrometer Onboard TRIPLE

W. Gurlit, K. Gerilowski, C. Gieseemann, V. Ebert, R. Zimmerman & J.P. Burrows

Validation of Envisat Products from SAOZ Balloon Flights

F. Goutail, A. Bazureau & J.P. Pommereau

Correlative Measurements of Selected Molecules over the Mediterranean Region

G. Bianchini, A. Boscaleri, F. Mencaraglia, E. Pascale & E. Castelli

SAFIRE-A Measurements During the ESABC Campaign

U. Cortesi, G. Bianchini, E. Castelli, B.M. Dinelli & C. Lee

Combined In Situ and Quasi In Situ Measurements Aboard M55 Geophysica Stratospheric Aircraft Dedicated for Envisat Satellite Data Validation

I. Kostadinov, G. Giovanelli, A. Petritoli et al.

Validation of MIPAS on ENVISAT by In Situ Instruments on the M55-Geophysica

J. Heland, H. Schlager, C. Schiller et al.

Validation of MIPAS on Envisat by Correlative Measurements of MIPAS-STR

G.Y. Liu, C.E. Blom, T. Gulde, C. Keim, M. Höpfner, P. Loës, C. Piesch & C. Sartorius

Measurements of Cloud and Aerosol Parameters in the Framework of Envisat Validation by Means of the High-Altitude Aircraft M55-Geophysica: An Overview

L. Stefanutti, A. Kentarchos, G. Fiocco et al.

Aerosol and Cloud Measurements by Means of the M-55 Geophysica in the Frame of the ENVISAT Validation Campaigns (July 2002 and October 2002)

M. Cacciani, F. Cairo, V. Mitev et al.

MIPAS Validation with the DLR Falcon

A. Fix, G. Poberaj, C. Kiemle, H. Flentje, R. Busen, M. Fiebig & G. Ehret

SCIAMACHY Validation by Measurements from Aircraft Platforms

G. Ehret, A. Fix, M. Gottwald et al.

Validation of Tropospheric Species Measured by SCIAMACHY Using the AMAXDOAS Instrument on board the DLR Falcon

T. Wagner, M. Bruns, J.P. Burrows et al.

- **Odin Session**

(not available)

2. MERIS Validation

Meris Diffuser Calibration At TNO TPD (Synthesis of the Results 1996-2002)

G. Bazalgette Courrèges-Lacoste, J. Groote Schaarsberg, C. Van Eijk-Olij

Radiative Transfer Code Comparison for Meris Vicarious Calibration

R. Santer, F. Zagolski & E. Dilligeard

Satellite Sensor Inter-Calibration – A Case Study for 28 March 2002

J. Nieke, M. Hori, R. Höller, I. Asanuma & T. Aoki

Calibration and Validation of Envisat MERIS – Part 1: Vicarious Calibration at Rail Road Valley Playa (NV)

M. Kneubühler, M. Schaepman, K. Thome, F. Baret & A. Müller

Comparison of MSG/SEVIRI Calibration Reference with MERIS BRF Over Bright Desert Calibration Targets

Y.M. Govaerts & M. Clerici

Vicarious Calibration of MERIS Using SIMBADA Measurements

J.-M. Nicolas, P.-Y. Deschamps & G. Bécu

Calibration of MERIS on Envisat – Status at End 2002

L. Bourg, S. Delwart & J.-P. Huot

- **Level 2 Algorithms Verification**

Troubleshooting of the MERIS Processors During the Commissioning Phase

V. Fournier-Sicre & S. Bélanger

Verification of the Meris Level 2 Products

C. Brockmann, U. Krämer, K. Stelzer et al.

- **Radiative Transfer Code Intercomparison**

Uncertainties In Radiative Transfer Computations – Consequences on the MERIS Level-2 Products

R. Santer, J. Fischer, F. Zagolski, D. Ramon, E. Dilligeard & Ph. Dubuisson

- **Water Vapour and Cloud**

Verification of MERIS Level 2 Products: Cloud Top Pressure and Cloud Optical Thickness

R. Preusker, P. Albert & J. Fischer

Verification of Meris Atmospheric Level 2 Products: Integrated Water Vapour Above Land, Ocean and Clouds

P. Albert, R. Preusker & J. Fischer

MERIS Surface Pressure and Cloud Flag: Present Status and Improvements

D. Ramon, R. Santer & P. Dubuisson

First Validation of MERIS Aerosol Product Over Land

D. Ramon, R. Santer & J. Vidot

- **Vegetation**

Meris Land Algorithm: Preliminary Validation Results

N. Gobron, M. Taberner, B. Pinty, F. Mélin, M.M. Verstraete & J.-L. Widlowski

- **Case 1 Water Products Validation**

Medium Resolution Imaging Spectrometer (MERIS) Validation: Early Results at the Boussole Site (Mediterranean Sea)

D. Antoine, A. Morel, S.B. Hooker, et al.

Intercomparison of SeaWiFS and MERIS Marine Products on Case 1 Waters

V. Fournier-Sicre & S. Belanger

Bencal, MERIS-MODIS- SeaWiFS Satellite Calibration and Validation in the Benguela Ecosystem

J. Aiken, J. Fishwick, G. Moore et al.

MERIS Level-2 Products Validation Using SIMBADA Radiometer Network

G. Bécu, P.-Y. Deschamps & J.-M. Nicolas

- **Case 2 Water Products Validation**

An Inter-comparison of Coloured Dissolved Organic Material and Phytoplankton Absorption Coefficients: Implications for MERIS Data Validation

G.H. Tilstone, V. Martinez Vicente, K. Sørensen, R. Röttgers & J. Høkedal

An Intercomparison of *In Vitro* Chlorophyll-A Determinations Preliminary Results

K. Sørensen, M. Grung & R. Röttgers

Intercomparison of Spectral Backscattering Coefficients Measured In Situ Using Several Hydrosat Instruments – Results from PlymCal-2 and REVAMP Cruises

P.V. Jørgensen, G. Tilstone, J. Høkedal & W. Schönfeld

- **Early Results**

Early Results for Validation of MERIS Water Products in the Skagerrak

K. Sørensen, J. Høkedal, E. Aas, R. Doerffer & E. Dahl

MERIS Validation In the North West Mediterranean and Mascarene Ridge (Indian Ocean)

A. Weeks, A. Cruzado & Z. Velasquez

MERIS Case 2 Water Validation Early Results North Sea / Helgoland /German Bight

R. Doerffer, H. Schiller, H. Krasemann et al.

Preliminary Validation of MERIS Water Products for Belgian Coastal Waters

K. Ruddick, V. De Cauwer, Y. Park et al.

MERIS Validation of Geophysical Ocean Colour Products: Preliminary Results for the Netherlands

R. Pasterkamp, S.W.M. Peters & H. van der Woerd

Using the Siscal In Situ Measurements for the Validation of the MERIS Algal Pigment Indices I and II

F. Fell, M. Brozek, B. Herut & T. Johansen

MERIS Validation Activities at the AAOT Site

G. Zibordi, F. Mélin, D. D'Alimonte & D. van der Linde

3. AATSR Validation

The AATSR Validation Programme: An Overview

M. Edwards & D. Llewellyn-Jones

Algorithm Verification for AATSR: Level 2 Verification

A.R. Birks

Validation of the AATSR Meteo Product Sea-Surface Temperature Against In Situ Observations And Analyses

L.A. Horrocks, J.G. Watts, R.W. Saunders & A. O'Carroll

AATSR Validation Campaigns Using the ISAR Radiometer System

C.J. Donlon & I.S. Robinson

Validation of AATSR-Derived Sea Surface Temperature in Australian Waters

I. Barton, A. Pearce, M. Mahoney, L. Clementson & M. Edwards

SCIPIO – Validation of ATSR-2 and AATSR with SISTeR

T. Nightingale

AATSR SST Validation using M-AERI

P.J. Minnett & M.C. Edwards

The MIAMI-2001 Radiometer Intercomparison

P.J. Minnett, I.J. Barton & J.P. Rice

4. Altimetry

- **Approach and Objections -RA2, MWR, Doris**

Envisat-1 MWR, In Flight Functional and Performance Verification

M. L'Abbate, O. Bombaci, G. Alberti & P. Féménias

IN-Flight Calibration/validation of the Envisat MWR

E. Obligis, L. Eymard, J. Durandeu, F. Mertz & Y. Faugère

- **Absolute Calibration Altimetry**

RA-2 Absolution Range Calibration

M. Roca, C.R. Francis, J. Font et al.

RA-2 Sigma-0 Absolute Calibration

M. Roca, H. Jackson & C. Celani

- **Cross-Calibration and Product Validation**

Verification of the RA-2/MWR Level 2 Geophysical Reference Processors

M.P. Milagro-Perez, B. Soussi, S. Baker et al.

RA-2/MWR Cross-Calibration and Validation: Objectives, Approach Results and Recommendations

J. Benveniste and the RA-2/MWR Cross-Calibration & Validation Team

4. ASAR

- **Instrument and Processor Performance**

Update on Antenna Elevation Pattern Estimation from Rain Forest Data

M. Zink

- **Product Quality Update**

ASAR Image and Wide Swath Mode Optimisations and Product Quality Update

B. Rosich

Quality ASAR Level 0 Product Analysis for Alternating Polarisation and Global Monitoring Mode

B. Schättler

ASAR APP and APM Image Product Quality

P. Meadows & T. Wright

ASAR IMG and APG Products: Image Quality and Radiometric Performance

M. Pirri

Performance of Envisat / ASAR Interferometric Products

J. Holzner

Validation of Envisat ASAR Geocoded Products

D. Kosmann & M. Huber

Preliminary Validation of ASAR Geometric Accuracy

D. Small, A. Schubert, U. Krüttli, E. Meier & D. Nüesch

Geometric Validation of PF-ASAR IMP and IMM Products

H. Raggam, M. Franke & W. Hummelbrunner

- **Wave Mode Validation and Summary**

Validation of ASAR Wave Mode Level 2 Product

H. Johnsen, G. Engen, B. Chapron, N. Walker & J. Closa

Evaluation of Envisat ASAR Wave Mode Retrieval Algorithms for Sea-State Forecasting and Wave Climate Assessment

F.J. Melger

List of Participants