SP-628
July 2006

Proceedings of the First

Atmospheric Science Conference

8 – 12 May 2006
ESRIN, Frascati, Italy

European Space Agency
Agence spatiale européenne

Publication	Proceedings of the First 'Atmospheric Science Conference' Frascati, Italy (ESA SP-628, July 2006)
Edited by *Compiled by*	H. Lacoste L. Ouwehand
Published and distributed by	ESA Publications Division ESTEC, Noordwijk, The Netherlands
Printed in	The Netherlands
Price	Eur 60
ISBN	92-9092-939-1
ISSN	1609-042X
Copyright	© 2006 European Space Agency

CONTENTS

Missions Overview / Instrument and Product Status

Data Quality

Poster Papers (Instrument Performance / Data Quality / Intercomparison)

Validation of Ozone Profiles Retrieved from Sciamachy Lunar Occultation Measurements
L.K. Amekudzi, A. Bracher, K. Bramstedt et al.

Validation of OMITotal Ozone Using Ground-Based Brewer Observations
D. Balis, E. Brinksma, M. Kroon et al.

Global Comparisons of Total O_3 Columns from Sciamachy Weighting Function DOAS (WFD) Algorithm to OMI-TOMS, GOME WFD and Ground-Based Measurements
A. Bracher, L.N. Lamsal, M. Weber & J.P. Burrows

The Evaluation of Sciamachy CO and CH_4 Scientific Data Products, Using Ground-Based FTIR Measurements
B. Dils, M. De Mazière, J.F. Müller et al.

The DCFI-ISAC MIPAS Database: 2-D Routine Analysis of MIPAS Observations
B.M. Dinelli, E. Arnone, G. Brizzi et al.

Laser Methods for the Accurate Calibration of Satellite-Derived Aerosol and Water Vapor
L. Fiorani, M. Aglione, I. Okladnikov & A. Palucci

Ten Years of NO_2 Comparisons Between Ground-Based SAOZ and Satellite Instruments (GOME, Sciamachy, OMI)
D. Ionov, F. Goutail, J.-P. Pommereau et al.

BrO Profiling from Ground-Based DOAS Observations: New Tool for the Envisat/Sciamachy Validation
F. Hendrick, *M. Van Roozendael, M. De Mazière et al.*

Results from the Three Canadian Arctic Validation of ACE Campaigns Conducted at Eureka from 2004 to 2006
T. Kerzenmacher, K.A. Walker, K. Strong et al.

Validation of the Chemistry-Transport Model MOCAGE Using Satellite Observations
M. Martet & V.-H. Peuch

Sciamachy Light Path Monitoring Results
S. Noël, H. Bovensmann, K. Bramstedt et al.

Overview of Sciamachy Level 2 Data Quality
A. Piters, K. Bramstedt, M. De Mazière et al.

Geophysical Validation of Temperature Retrieved by the ESA Level 2 Processor from MIPAS/Envisat Measurements
M. Ridolfi, U. Blum, B. Carli et al.

Comparison of Two Years of Methane Column Retrievals from Sciamachy Observations in the 1.65 and 2.33 Micrometer Windows
H. Schrijver, A. Gloudemans, S. Houweling & I. Aben

Validation of 'Cloud-Free' Tropical UTLS MIPAS Ozone and Water Vapour
H. Sembhi, J.J Remedios, J. Greenhough & P. Raspollini

Long Term Monitoring of GOME/ERS-2 Calibration Parameters
M. Coldewey-Egbers, S. Wahl, S. Slijkhuis et al.

A New Tool for Sciamachy Level 1b to 1c Processing
S. Slijkhuis, S. Wahl, B. Aberle et al.

Improvements of GDP Level 0 - 1 Processing System in the Framework of CHEOPS-GOME
S. Slijkhuis, B. Aberle & D. Loyola

Preliminary Validation Results of the OMI O_2-O_2 Cloud Product
M. Sneep, P. Veefkind, J. de Haan & P. Stammes

Validation of the GOMOS High-Resolution Temperature Product (HRTP) Using Lidar
K. Stebel, G. Hansen, Y. Meijer et al.

Comparison of Three Simplified Algorithms for Atmospheric Corrections of MERIS Data Over Land
J. Telaar & M. von Schönermark

Sciamachy Reflectance and Polarisation Validation: Sciamachy Versus Polder
L. G. Tilstra & P. Stammes

OMI In-Flight Wavelength Calibration and the Solar Reference Spectrum
R. Voors, R. Dirksen, M. Dobber & P. Levelt

Retrieval Algorithms

Contributed Papers
10-Years Operational GOME/ERS-2 Total Column Products: The GDP 4.0 Algorithm
D. Loyola, M. Van Roozendael, R. Spurr et al.

High-Resolution Density and Temperature Profiling in the Stratosphere Using Bi-Chromatic Scintillation Measurements by GOMOS
F. Dalaudier, V. Sofieva, A. Hauchecorne et al.

MIPAS New Measurement Scenario: Enhanced Vertical Resolution and Regularization
S. Ceccherini, C. Belotti, B. Carli et al.

Posters Papers
Retrieving the Velocities of Motion of Air Masses from Digital Images of Clouds
D. Bakalov & K. Bakalova

Regridding of Remote Sensing Retrievals: Formalism and Application to GOME vs Microwave Ozone Profile Comparison
Y. Calisesi, R. van Oss & V.T. Soebijanta

Tropospheric and Stratospheric BrO and NO_2 Columns Derived by Use of Satellite Observations and 3D CTM FinROSE
P. Post, L. Backman, L. Thölix et al.

Infra-Red Remote Sensing of Organic Compounds in the Upper Troposphere
J. Remedios, G.Allen & A.M. Waterfall

Recent Advances in Sciamachy Near Infrared Nadir Level 2 Algorithm Development
F. Schreier, M. Hess, A. Doicu et al.

Estimation of No_2 Amounts Emitted from the Portuguese Wildfires in 2005: A Synergistic Use of Observations by Imaging and Atmospheric Instruments and Chemistry-Transport Models
J. Meyer-Arnek, P. Valks, M. Fader & T. Erbertseder

Posters Papers

Nighttime NO_x from Sciamachy Lunar Occultation Measurements
L.K. Amekudzi, A. Bracher, K. Bramstedt et al.

Sciamachy Solar Occultation: Ozone and NO_2 Profiles 2003-2005
K. Bramstedt, A. Bracher, J. Meyer et al.

DOAS Retrieval of Glyoxal from Space
S. Beirle, R. Volkamer, F. Wittrock et al.

Carbon Monoxide, Methane and Carbon Dioxide Retrieved from Sciamachy Near-Infrared Nadir Observations Using WFM-DOAS
M. Buchwitz, R. de Beek, J. P. Burrows et al.

A Simplified Forward Model of Limb Infrared Emission Spectra in a Two-Dimensional Atmosphere
C. De Clercq & J.-C. Lambert

Retrieval of Formaldehyde Columns from GOME as Part of the GSE Promote and Comparison with 3D-CTM Calculations
I. De Smedt, J.F. Müller, M. Van Roozendael et al.

Quantitative Troposphere Composition Retrievals from Satellite Measurements: Initial Results
L. Gunn, M. Chipperfield, R. Siddans & B. Kerridge

Effect of Forest Fires on the Air Quality in Seoul from MOPITT Measurements
J. Kim, H.C. Lee, D. Edwards et al.

GOME and Sciamachy Global Water Vapour Columns
S. Noël, S. Mieruch, M. Buchwitz et al.

Transport Studies in the Stratosphere 2003 Using MIPAS Observations
Y. van Orsolini, W.A. Lahoz & A.J. Geer

Tropospheric NO_2 Column and AOD from Sciamachy: A Case Study on the Aerosol Effect on the NO_2 Retrieval
A. Petritoli, E. Palazzi, G. Giovanelli et al.

Carbon Tetrafluoride from MIPAS Measurements
C. Piccolo & A. Dudhia

Vector Spherical Radiative Transfer Model MCC++: Linearization with Respect to BRDF Surface Properties
O. Postylyakov

Retrieval of BrO Columns from Sciamachy and their Validation Using Ground-Based DOAS Measurements
N. Theys, F. Hendrick, M. Van Roozendael et al.

Quantitative Analysis of Volcanic Sulfur Dioxide Emissions Using GOME Backscatter Measurements
W.Thomas, T. Erbertseder, T. Ruppert et al.

Modeling and Retrieval of Atmospheric Spectra Using ASIMUT
A.C. Vandaele, M. Kruglanski & M. De Mazière

Impact of Effective Cloud Fraction Assumption on Tropospheric NO_2 Retrievals
P. Wang, P. Stammes & F. Boersma

Aerosols / Clouds / UV

Contributed Papers
Sciamachy to a Reflectance Correction Effects on Aerosol Optical Depth Retrieval
W. Di Nicolantonio, A. Cacciari, S. Scarpanti et al.

Three Years of Envisat Synergetic Aerosol Retrieval
T. Holzer-Popp & M. Schroedter-Homscheidt

Probing Internal Cloud Properties from Space
T. Wagner, S. Beirle, T. Deutschmann et al.

Surface UV Irradiance from OMIon EOS-Aura
A. Tanskanen, A. Määttä, N. Krotkov et al.

Poster Papers
Optical Thickness of Winter Clouds from Ground-Based Visible Images
K.P. Bakalova & D.D. Bakalov

The Sciamachy Cloud Products Derived Using the Semi-Analytical Cloud Retrieval Algorithm
A. Kokhanovsky, V. Rozanov, M. Vountas et al.

Aerosol Characterization over Northern Greece; Aerosol Loading Derived from Satellite Observations and Ground-Based Measurements
M.E. Koukouli, D. Balis, A. Bais et al.

Aerosol Optical Depth Retrieval over Land Using MeteoSat-8 SEVIRI Data
C. Popp, N. Foppa, A. Hauser & S. Wunderle

Fresco+: An Improved Cloud Algorithm for GOME and Sciamachy
P. Wang, P. Stammes, N. Fournier & R. van der A

Data Assimilation

Contributed Papers
The Asset Intercomparison Project
W. Lahoz, A. Geer, S. Bekki et al.

Simultaneous Assimilation of Envisat/MIPAS and ODIN/SMR Ozone Profiles into a Chemistry Transport Model
S. Massart & D. Cariolle

Applications

Contributed Papers

Towards a Robust Estimate of the Global Lightning Nitrogen Oxides Source Rate and its Error Bound
U. Schumann, C. Kurz, H. Schlager et al.

Regional Air Quality Forecasting over Greece within Promote
A. Poupkou, D. Melas, I. Kioutsioukis et al.

Emissions of International Shipping as Seen by Satellites
H. Bovensmann, V. Eyring, K. Franke et al.,

Poster Papers

Sciamachy 4 Years in Orbit – Instrument Operations and In-Flight Performance Status
M. Gottwald, E. Krieg, S. Noël et al.

Development and Applications of Atmospheric Chemistry Products from Operational Environmental Satellite Systems
S. Kondragunta, L.E. Flynn, C. Barnet et al.

Radiometer-Based Estimation of the Atmospheric Optical Thickness
V. Karathanassi, D. Rokos, V. Andronis & A. Papayannis

IGACO-Ozone: The First Step in Implementing IGACO
A. Mälkki, L. Backman, Anders Lindfors et al.

Satellite Application Facility on Ozone and Atmospheric Chemistry Monitoring
T. Riihisaari, L. Backman, D. Loyola et al.

Modeling CO_2 Sinks and Sources of European Land Vegetation Using Remote Sensing Data
K. Wißkirchen & K. Günther

Future Missions

Contributed Papers

Operational Atmospheric Chemistry Monitoring Missions (Capacity)
H. Kelder, A. Goede & M. van Weele

GOME-2 on MetOp
R. Munro, C. Anderson, J. Callies et al.

List of Participants