

PROCEEDINGS OF SPIE

Remote Sensing of Clouds and the Atmosphere XII

**Adolfo Comerón
Richard H. Picard
Klaus Schäfer
James R. Slusser
Aldo Amodeo**
Editors

**17–19 September 2007
Florence, Italy**

Sponsored by
SPIE Europe

Cooperating Organisations
SPIE
EOS—European Optical Society
NASA—National Aeronautics and Space Administration (USA)
SIOF—Società Italiana di Ottica e Fotonica (Italy)

Published by
SPIE

Volume 6745

Proceedings of SPIE, 0277-786X, v. 6745

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

The papers included in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. The papers published in these proceedings reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from this book:

Author(s), "Title of Paper," in *Remote Sensing of Clouds and the Atmosphere XII*, edited by Adolfo Comerón, Klaus Schäfer, James R. Slusser, Richard H. Picard, Aldo Amodeo, Proceedings of SPIE Vol. 6745 (SPIE, Bellingham, WA, 2007) Article CID Number.

ISSN 0277-786X
ISBN 9780819469038

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445
SPIE.org

Copyright © 2007, Society of Photo-Optical Instrumentation Engineers

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/07/\$18.00.

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.


SPIEDigitalLibrary.org

Paper Numbering: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent citation identifier (CID) number is assigned to each article at the time of the first publication. Utilization of CIDs allows articles to be fully citable as soon they are published online, and connects the same identifier to all online, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc.

The CID number appears on each page of the manuscript. The complete citation is used on the first page, and an abbreviated version on subsequent pages. Numbers in the index correspond to the last two digits of the six-digit CID number.

Contents

xi	<i>Conference Committee</i>
xiii	<i>Introduction</i>

SESSION 1 REMOTE SENSING OF AEROSOLS, TRACE GASES, AND METEOROLOGICAL PARAMETERS

6745 02	Carbon dioxide retrieval from reflected sunlight spectra in the presence of cirrus cloud: model studies [6745-01] A. Bril, S. Oshchepkov, T. Yokota, National Institute for Environmental Studies (Japan)
6745 03	Ozone depletion in the Austral spring from UV microsatellite instrument [6745-02] J. A. Fernandez-Saldivar, C. I. Underwood, Univ. of Surrey (United Kingdom); S. Mackin, Surrey Satellite Technology Ltd. (United Kingdom)
6745 04	Accomplishments of the Atmospheric Infrared Sounder (AIRS) and the need for higher spatial resolution in the future [6745-03] T. S. Pagano, M. T. Chahine, H. H. Aumann, E. Fetzer, S. Broberg, Jet Propulsion Lab. (USA)
6745 06	Aerosol characterization of Morocco with AERONET and intercomparison with satellite data: TOMS, MODIS, and MISR [6745-06] A. Bounhir, Z. Benkhaldoun, Cadi Ayyad Univ. (Morocco); M. Sarazin, ESO (Germany)
6745 07	Remote sensing of precipitable water vapour and cloud cover for site selection of the European Extremely Large Telescope (E-ELT) using MERIS [6745-07] H. Kurlandczyk, M. Sarazin, European Organisation for Astronomical Research in the Southern Hemisphere (ESO) (Germany)
6745 08	Use of satellite data for astronomical site characterization [6745-08] A. M. Varela, Instituto de Astrofísica de Canarias (Spain); C. Bertolin, Institute of Atmospheric and Climate Sciences (Italy); C. Muñoz-Tuñón, J. J. Fuensalida, Instituto de Astrofísica de Canarias (Spain); S. Ortolani, Univ. of Padova (Italy)
6745 09	Stratospheric and upper tropospheric aerosol retrieval from limb scatter signals [6745-09] D. Rault, NASA Langley Research Ctr. (USA); R. Loughman, Hampton Univ. (USA)
6745 0A	Optimal estimation applied to the retrieval of aerosol load using MSG/SEVIRI observations [6745-10] S. Wagner, Wagner Consulting (Germany); Y. M. Govaerts, EUMETSAT (Germany); A. Lattanzio, Makalumedia (Germany); Ph. Watts, EUMETSAT (Germany)
6745 0B	Dust aerosol optical depth retrieval over desert surface using the SEVIRI window channels [6745-11] B. De Paepe, Vrije Univ. Brussel (Belgium); S. Dewitte, Royal Meteorological Institute of Belgium (Belgium)

- 6745 0C **Retrieval of atmospheric water content based on AISA+ data** [6745-63]
Q. Cheng, Second Institute of Oceanography (China) and Zhejiang Gongshang Univ. (China); D. Pan, D. Wang, J. Chen, T. Mao, Second Institute of Oceanography (China)
- 6745 0D **An aerosol optical thickness retrieval algorithm for Meteosat Second Generation (MSG) data over land: application to the Mediterranean area** [6745-64]
L. Guerrieri, Modena and Reggio Emilia Univ. (Italy); S. Corradini, Istituto Nazionale di Geofisica e Vulcanologia (Italy); S. Pugnaghi, R. Santangelo, Modena and Reggio Emilia Univ. (Italy)
- 6745 0E **Stratospheric ozone and nitrogen dioxide total column and vertical profiles in southern Portugal during 2004–2007** [6745-65]
D. Bortoli, A. M. Silva, D. Roselli, Univ. of Évora (Portugal); G. Giovanelli, Institute of Atmospheric Sciences and Climate, CNR (Italy)
- 6745 0F **Fine mode aerosols on a global scale** [6745-66]
I. Sano, S. Mukai, Kinki Univ. (Japan); M. Mukai, Univ. of Tokyo (Japan)
- 6745 0G **Aerosol optical properties variation on different mountain sites in Italy** [6745-67]
G. Pavese, IMAA, CNR (Italy); F. Esposito, Univ. della Basilicata (Italy); L. Leone, R. Restieri, C.R.A.B.-ARPAB (Italy); M. Calvello, IMAA, CNR (Italy) and Univ. della Basilicata (Italy); G. Grieco, G. Masiello, C. Serio, Univ. della Basilicata (Italy)

SESSION 2 REMOTE SENSING OF CLOUDS

- 6745 0I **Experimental studies of infrared scattering and polarization properties of crystalline clouds to improve atmospheric models for remote sensing of the Earth's atmosphere from space** [6745-12]
T. Humpherys, Utah State Univ. Research Foundation (USA); V. Ivanov, G. Yaskevich, Research and Production Association Typhoon (Russia); J. DeVore, A. T. Stair, Visidyne, Inc. (USA); J. Watson, The Aerospace Corp. (USA); V. Abramov, Scientific Research Ctr. Astroinform SPE (Russia); I. Schiller, Visidyne, Inc. (USA); D. Chvanov, Utah State Univ. Research Foundation (USA)
- 6745 0J **Cloud top height estimation using simulated METEOSAT-8 radiances** [6745-13]
R. Borde, EUMETSAT (Germany); P. Dubuisson, ELICO, Univ. du Littoral Côte d'Opale (France)
- 6745 0K **An assessment of the on-orbit performance of the CALIPSO wide field camera** [6745-14]
M. C. Pitts, L. W. Thomason, Y. Hu, D. M. Winker, NASA Langley Research Ctr. (USA)
- 6745 0L **Sensitivity of passive measurements in VIS, SWIR, and TIR to cirrus microphysical vertical profile: application to cloud remote sensing from MODIS** [6745-15]
B. Marchant, G. Brogniez, J. Riedi, P. Dubuisson, L. Labonnote, Univ. des Sciences et Technologies de Lille (France)
- 6745 0M **Optical properties of cirrus clouds at a mid-latitude EARLINET station** [6745-16]
E. Giannakaki, D. Balis, Lab. of Atmospheric Physics (Greece); V. Amiridis, Institute for Space Applications and Remote Sensing (Greece); S. Kazadzis, Lab. of Atmospheric Physics (Greece)

- 6745 ON **Retrieval of cloud optical parameters from data of reflected radiance multiangle observation** [6745-17]
I. Melnikova, Research Ctr. for Ecological Safety (Russia); A. Vasilyev, St. Petersburg State Univ. (Russia); N. Konovalov, Keldysh Institute for Applied Mathematics (Russia)
- 6745 OP **Study on methods of cloud identification and data recovery for MODIS data** [6745-52]
X. Wu, Q. Cheng, Zhejiang Gongshang Univ. (China)
- 6745 OR **Cloud climatology in the Canary Islands region using NOAA-AVHRR data** [6745-54]
A. González, A. Cerdeña, J. C. Pérez, A. M. Díaz, Univ. of La Laguna (Spain)

SESSION 3 LIDAR, RADAR, AND PASSIVE (MICROWAVE, INFRARED, VISIBLE, AND UV) ATMOSPHERIC MEASUREMENT TECHNIQUES

- 6745 OW **Long-term monitoring of layering of lower atmosphere in urban environments by ceilometer** [6745-22]
K. Schäfer, S. Emeis, C. Jahn, Forschungszentrum Karlsruhe GmbH (Germany); C. Münkel, Vaisala GmbH (Germany); C. Münsterer, U. Im, Forschungszentrum Karlsruhe GmbH (Germany)
- 6745 OX **Water vapour mixing ratio distribution in the area of Naples by Raman lidar measurements and a high resolution model** [6745-23]
M. G. Frontoso, Univ. of Naples Federico II (Italy); R. Ferretti, Univ. of L'Aquila (Italy); G. Pisani, Univ. of Naples Federico II (Italy); X. Wang, Coerentia (Italy) and CNR-INFM (Italy); N. Spinelli, Univ. of Naples Federico II (Italy)
- 6745 OY **A European research infrastructure for the aerosol study on a continental scale: EARLINET-ASOS** [6745-24]
A. Amodeo, G. Pappalardo, Istituto di Metodologie per l'Analisi Ambientale, CNR (Italy); J. Bösenberg, Max-Planck-Institut für Meteorologie (Germany); A. Ansmann, Leibniz Institute for Tropospheric Research (Germany); A. Apituley, National Institute for Public Health and the Environment (Netherlands); L. Alados-Arboledas, Univ. de Granada (Spain); D. Balis, Aristoteleio Panepistimio (Greece); C. Böckmann, Univ. Potsdam (Germany); A. Chaikovskiy, B.I. Stepanov Institute of Physics (Belarus); A. Comeron, Univ. Politecnica de Catalunya (Spain); V. Freudenthaler, Ludwig-Maximilians-Univ. München (Germany); O. Gustaffson, Swedish Defence Research Agency (FOI) (Sweden); G. Hansen, Norwegian Institute for Air Research (Norway); V. Mitev, Observatoire Cantonal de Neuchâtel (Switzerland); D. Nicolae, National Institute of Research and Development for Optoelectronics (Romania); A. Papayannis, National Technical Univ. of Athens (Greece); M. R. Perrone, Univ. degli Studi di Lecce (Italy); A. Pietruczuk, Institute of Geophysics (Poland); M. Pujadas, Ctr. de Investigaciones Energéticas, Medioambientales y Tecnológicas (Spain); J.-P. Putaud, EC Joint Research Ctr. (Italy); F. Ravetta, Univ. Pierre et Marie Curie (France); V. Rizi, Univ. degli Studi dell'Aquila (Italy); V. Simeonov, Ecole Polytechnique Fédérale de Lausanne (Switzerland); N. Spinelli, Consorzio Nazionale Interuniversitario per le Scienze Fisiche della Materia (Italy); D. Stoyanov, Institute of Electronics (Bulgaria); T. Trickl, Forschungszentrum Karlsruhe IMK-IFU (Germany); M. Wiegner, Ludwig-Maximilians-Univ. München (Germany)

- 6745 0Z **Improvement of broadband radiance to flux conversion by using the synergy between active and passive remote sensing instruments** [6745-25]
C. Doménech, Univ. de València (Spain); D. P. Donovan, Royal Netherlands Meteorological Institute (Netherlands); H. W. Barker, Meteorological Service of Canada (Canada); M. Bouvet, ESTEC European Space Agency (Netherlands); E. López-Baeza, Univ. de València (Spain)
- 6745 11 **Statistical approach to validation of satellite atmospheric retrievals** [6745-27]
N. Pougatchev, G. Bingham, Space Dynamics Lab. (USA); D. Seidel, NOAA Air Resources Lab. (USA); F. Berger, German Meteorological Service (Germany)
- 6745 12 **The GERB Edition 1 products SEVIRI scene identification** [6745-28]
A. Ipe, Royal Meteorological Institute of Belgium (Belgium) and Vrije Univ. Brussel (Belgium); C. Bertrand, Royal Meteorological Institute of Belgium (Belgium); N. Clerbaux, Royal Meteorological Institute of Belgium (Belgium) and Vrije Univ. Brussel (Belgium); S. Dewitte, L. Gonzalez, Royal Meteorological Institute of Belgium (Belgium)
- 6745 13 **Integrated cloud-aerosol-radiation product using CERES, MODIS, CALIPSO, and CloudSat data** [6745-29]
S. Sun-Mack, SSAI (USA); P. Minnis, NASA Langley Research Ctr. (USA); Y. Chen, S. Gibson, Y. Yi, Q. Trepte, SSAI (USA); B. Wielicki, NASA Langley Research Ctr. (USA); S. Kato, SSAI (USA); D. Winker, NASA Langley Research Ctr. (USA); G. Stephens, Colorado State Univ. (USA); P. Partain, STC (USA)
- 6745 14 **The slow mode of the CERES scanning radiometers** [6745-30]
Z. P. Szewczyk, SSAI (USA); G. L. Smith, National Institute for Aerospace (USA); K. J. Priestley, Langley Research Ctr. (USA)

SESSION 4 RADIATIVE TRANSFER

- 6745 16 **Influence of atmospheric profiles variations on airborne infrared limb observations** [6745-31]
C. Malherbe, P. Chervet, ONERA (France)
- 6745 17 **An atmospheric correction iterative method for very high resolution aerospace imaging spectrometers** [6745-32]
A. Barducci, D. Guzzi, P. Marcoionni, I. Pippi, CNR - IFAC (Italy)
- 6745 18 **Characterization of tropical atmosphere through wide-band emission spectra acquired with a balloon-borne uncooled FTS spectroradiometer** [6745-33]
G. Bianchini, L. Palchetti, B. Carli, U. Cortesi, S. Del Bianco, Istituto di Fisica Applicata Nello Carrara, CNR (Italy)
- 6745 19 **Extension of Chandrasekhar's formula to non-homogeneous Lambertian surfaces and comparison with the 6S formulation** [6745-34]
A. Sei, Northrop Grumman Space Technology (USA)
- 6745 1A **Adjacency effects for two Lambertian half-spaces** [6745-35]
A. Sei, Northrop Grumman Space Technology (USA)

- 6745 1E **Extension of Chandrasekhar's formula to a homogeneous non-Lambertian surface and comparison with the 6S formulation** [6745-62]
A. Sei, Northrop Grumman Space Technology (USA)
- 6745 1F **Retrieval of atmospheric temperature and water vapour content from thermal infrared hyperspectral data in a purpose of atmospheric compensation** [6745-57]
V. Achard, S. Lesage, L. Poutier, ONERA (France)
- 6745 1G **A semianalytic Monte Carlo code for modelling LIDAR measurements** [6745-58]
E. Palazzi, I. Kostadinov, A. Petritoli, F. Ravegnani, Institute of Atmospheric Science and Climate (Italy); D. Bortoli, Institute of Atmospheric Science and Climate (Italy) and Univ. of Évora (Portugal); S. Masieri, M. Premuda, G. Giovanelli, Institute of Atmospheric Science and Climate (Italy)
- 6745 1I **Evaluation of adjacency effect for MIVIS airborne images** [6745-60]
C. Bassani, R. M. Cavalli, Institute for Atmospheric Pollution, CNR (Italy); S. Pignatti, Institute of Methodologies for Environmental Analysis, CNR (Italy); F. Santini, Institute for Atmospheric Pollution, CNR (Italy)
- 6745 1J **Far-infrared spectrally resolved broadband emission of the atmosphere from Morello and Gomito mountains near Florence** [6745-61]
G. Bianchini, L. Palchetti, A. Baglioni, F. Castagnoli, Istituto di Fisica Applicata Nello Carrara, CNR (Italy)

SESSION 5 REMOTE SENSING OF THE MIDDLE AND UPPER ATMOSPHERE

- 6745 1K **Anisotropic refractive index fluctuations spectrum in the stratosphere sensed from balloon-borne observations of stellar scintillation** [6745-39]
C. Robert, J.-M. Conan, V. Michau, Office National d'Études et de Recherches Aérospatiales (France); J.-B. Renard, C. Robert, Lab. de Physique et Chimie de l'Environnement, CNRS (France); F. Dalaudier, Service d'Aronomie du CNRS (France)
- 6745 1L **Empirical storm-time correction to the international reference ionosphere model E-region electron and ion density parameterizations using observations from TIMED/SABER** [6745-41]
C. J. Mertens, NASA Langley Research Ctr. (USA); J. R. Winick, Air Force Research Labs. (USA); J. M. Russell III, Hampton Univ. (USA); M. G. Mlynczak, NASA Langley Research Ctr. (USA); D. S. Evans, NOAA Space Environment Ctr. (USA); D. Bilitza, George Mason Univ. (USA); X. Xu, SSAI (USA)
- 6745 1M **A new model for calculating infrared background radiance at all altitudes including atmospheric clutter and clouds** [6745-42]
R. Panfili, H. Dothe, J. W. Duff, J. Gruninger, Spectral Sciences, Inc. (USA); J. H. Brown, Air Force Research Lab. (USA)
- 6745 1N **Contributions of the OH airglow to space object irradiance** [6745-43]
J. Gruninger, J. W. Duff, Spectral Sciences, Inc. (USA); J. H. Brown, Air Force Research Lab. (USA)

SESSION 6 REMOTE SENSING OF EMISSION SOURCES, EXHAUSTS, AND FIRES

- 6745 1P **Budapest airport air quality long-term studies by remote sensing with DOAS and FTIR with focus upon runway emissions** [6745-45]
K. Schäfer, G. Schürmann, C. Jahn, C. Matuse, H. Hoffmann, E. Takacs, Forschungszentrum Karlsruhe GmbH (Germany); B. Alföldy, V. Groma, KFKI Atomic Energy Research Institute (Hungary); S. Kugler, Budapest Ferihegy International Airport (Hungary)
- 6745 1Q **Remote sensing of aircraft exhaust temperature and composition by passive Fourier Transform Infrared (FTIR)** [6745-46]
E. Flores, K. Schäfer, Forschungszentrum Karlsruhe GmbH (Germany); J. Black, Strategic Research Ctr., Rolls Royce plc (United Kingdom); R. Harig, Technische Univ. Hamburg-Harburg (Germany); C. Jahn, Forschungszentrum Karlsruhe GmbH (Germany)
- 6745 1R **Atmospheric aerosol characterization during Saharan dust outbreaks at Naples EARLINET station** [6745-47]
G. Pisani, CNISM (Italy) and Univ. di Napoli Federico II (Italy); M. Armenante, Istituto Nazionale di Fisica Nucleare (Italy); A. Boselli, Istituto di Metodologie per l'Analisi Ambientale, CNR (Italy); M. G. Frontoso, N. Spinelli, CNISM (Italy) and Univ. di Napoli Federico II (Italy); X. Wang, CNISM (Italy) and Coherentia - Istituto Nazionale per la Fisica della Materia, CNR (Italy)
- 6745 1S **Evolution study of smoke backscattering coefficients in a cell by means of a compact mobile Nd:YAG lidar system** [6745-48]
C. Bellecci, Univ. of Rome Tor Vergata (Italy); L. De Leo, CRATI s.c.r.l. (Italy); P. Gaudio, M. Gelfusa, Univ. of Rome Tor Vergata (Italy); T. Lo Feudo, CRATI s.c.r.l. (Italy); S. Martellucci, M. Richetta, Univ. of Rome Tor Vergata (Italy)
- 6745 1T **Properties of fire smoke in Eastern Europe measured by remote sensing methods** [6745-49]
A. Pietruczuk, Institute of Geophysics (Poland); A. P. Chaikovsky, B.I. Stepanov Institute of Physics (Belarus)
- 6745 1U **Diurnal radiative forcing of biomass burning aerosols over Africa from merged GERB and SEVIRI data** [6745-50]
C. Bertrand, A. Ipe, L. Gonzalez, G. Casanova, N. Clerbaux, D. Caprion, S. Dewitte, Royal Meteorological Institute of Belgium (Belgium)
- 6745 1V **Comparisons of satellite derived aerosol optical depth over a variety of sites in the southern Balkan region as an indicator of local air quality** [6745-51]
M. E. Koukouli, S. Kazadzis, Aristotle Univ. of Thessaloniki (Greece); V. Amiridis, National Observatory of Athens (Greece); C. Ichoku, NASA Goddard Space Flight Ctr. (USA); D. S. Balis, Aristotle Univ. of Thessaloniki (Greece)
- 6745 1X **Evaluation of air quality from space** [6745-69]
S. Mukai, I. Sano, Kinki Univ. (Japan); M. Mukai, Univ. of Tokyo (Japan); M. Yasumoto, Kinki Univ. (Japan)

- 6745 1Y **Multiple axis DOAS measurements for the retrieval of nitrogen dioxide and ozone vertical profiles in the presidential estate of Castel Porziano, Rome** [6745-70]
E. Palazzi, A. Petritoli, F. Ravagnani, I. Kostadinov, Institute of Atmospheric Science and Climate, (Italy); D. Bortoli, Institute of Atmospheric Science and Climate (Italy) and Geophysics Ctr. of Evora, Univ. of Evora (Portugal); S. Masieri, M. Premuda, G. Giovanelli, Institute of Atmospheric Science and Climate (Italy)
- 6745 1Z **Measurement and analysis of aerosol optical thickness over the East China Sea** [6745-71]
X. Deng, Nanjing Univ. of Information Science and Technology (China) and Second Institute of Oceanography (China); D. Pan, Second Institute of Oceanography (China); Z. Sun, Nanjing Univ. of Information Science and Technology (China); X. He, Second Institute of Oceanography (China); Z. Hao, Nanjing Univ. of Information Science and Technology (China) and Second Institute of Oceanography (China)
- 6745 20 **Air pollution monitoring using the open path technique** [6745-72]
L. Belegante, National Institute of Research and Development for Optoelectronics (Romania); D. Zisu, National Research and Development Institute for Environmental Protection (Romania); I. Ionel, Politehnica Univ. Timisoara (Romania); A. Nemuc, National Institute of Research and Development for Optoelectronics (Romania)
- 6745 21 **Influence of urban aerosol pollution to radiative forcing** [6745-73]
A. Nemuc, National Institute of Research and Development for Optoelectronics (Romania); S. Stefan, Univ. of Bucharest (Romania); C. L. Talianu, National Institute of Research and Development for Optoelectronics (Romania)
- 6745 22 **Satellite estimated cloud radiative forcing in the presence of aerosol events over the south of Portugal** [6745-74]
D. Santos, M. J. Costa, Univ. de Évora (Portugal); D. Bortoli, Univ. de Évora (Portugal) and Institute of Atmospheric Sciences and Climate, CNR (Italy); A. M. Silva, Univ. de Évora (Portugal)
- 6745 23 **Analysis of the measurements taken by a ceilometer installed in the south of Portugal** [6745-75]
M. J. Costa, Univ. of Évora (Portugal); D. Bortoli, Univ. of Évora (Portugal) and Institute of Atmospheric Sciences and Climate, CNR (Italy); S. Pereira, A. M. Silva, F. Wagner, N. Belo, Univ. of Évora (Portugal); J. L. Guerrero-Rascado, F. Navas-Guzman, L. Alados-Arboledas, Univ. de Granada (Spain)

Author Index

Conference Committee

Symposium Chair

Guido D'Urso, Università degli Studi di Napoli Federico II (Italy)

Symposium Cochair

Steven P. Neeck, NASA Headquarters (USA)

Conference Chairs

Adolfo Comerón, Universitat Politècnica de Catalunya (Spain)

Richard H. Picard, Air Force Research Laboratory (USA)

Klaus Schäfer, Forschungszentrum Karlsruhe GmbH (Germany)

James R. Slusser, Colorado State University (USA)

Program Committee

Aldo Amodeo, Istituto di Metodologie per l'Analisi Ambientale Potenza (Italy)

Michel R. Carleer, Universiteit Libre de Bruxelles (Belgium)

Sonnik Clausen, Risø National Laboratory (Denmark)

Wei Gao, Colorado State University (USA)

Roland Harig, Technische Universität Hamburg-Harburg (Germany)

Nicolaos I. Sifakis, National Observatory of Athens (Greece)

Michiel van Weele, Koninklijk Nederlands Meteorologisch Instituut (Netherlands)

Konradin Weber, Fachhochschule Düsseldorf (Germany)

Session Chairs

- 1 Remote Sensing of Aerosols, Trace Gases, and Meteorological Parameters
James R. Slusser, Colorado State University (USA)
- 2 Remote Sensing of Clouds
Klaus Schäfer, Forschungszentrum Karlsruhe (Germany)
- 3 Lidar, Radar, and Passive (Microwave, Infrared, Visible, and UV) Atmospheric Measurement Techniques
Adolfo Comerón, Universitat Politècnica de Catalunya (Spain)
- 4 Radiative Transfer
Richard H. Picard, Air Force Research Laboratory (USA)

- 5 Remote Sensing of the Middle and Upper Atmosphere
Klaus Schäfer, Forschungszentrum Karlsruhe GmbH (Germany)
- 6 Remote Sensing of Emission Sources, Exhausts, and Fires
Aldo Amodeo, Consiglio Nazionale delle Ricerche (Italy)

Introduction

The scope of this 12th edition of the Remote Sensing of Clouds and the Atmosphere conference covers a broad range of topics, from theoretical analysis to end-user applications of remote sensing products, passing through a variety of intermediate issues, such as modeling, experimental and instrumental techniques and methods, and inversion algorithms. However difficult to summarize such a diversity of aspects, some clear scientific and technological trends, frequently intersecting each other, emerge when browsing through the different papers included in these proceedings.

The modeling and experimental communities come closer through feedback between measurements and ever more sophisticated models. Connection is made between models and observations at a variety of scales, from local to regional to global, through the synergies between satellite, airborne and ground-based measurements. Advances are reported for a wide range of atmospheric vertical regions, including atmospheric boundary layer, troposphere, stratosphere and MLTI (mesosphere, lower-thermosphere, ionosphere).

The availability of ever more powerful computation capabilities facilitates multi-instrument data merging to improve the characterization of atmospheric parameters and model testing: several instruments are interconnected into a single macroinstrument, geographically dispersed observations systems are combined into a single infrastructure (e.g. AERONET, EARLINET...), remote sensing instruments get out of the laboratory and gather data in field campaigns with unprecedented flexibility, and the outputs of different instruments are combined to provide enhanced data products (e.g. the A-Train).

The presentations were arranged into six oral topical sessions:

- Remote sensing of aerosols, trace gases, and meteorological parameters
- remote sensing of clouds
- Lidar, radar, and passive (microwave, infrared, visible, and UV) atmospheric measurements techniques
- Radiative transfer
- Remote sensing of the middle and upper atmosphere
- Remote sensing of emission Sources, exhausts, and fires.

In addition, one extensive poster session was held with presentations classified according to the topics of the oral sessions. Poster discussions are becoming an increasingly useful complement to the oral sessions.

These proceedings contain the reviewed and revised papers corresponding to the presentations. No distinction is made between those corresponding to oral and poster presentations, as the only difference is the way in which the technical content was delivered to the audience.

We would like to thank the SPIE staff for their invaluable work in the organization of the conference and the editing of these proceedings.

Adolfo Comerón
Richard H. Picard
Klaus Schäfer
James R. Slusser
Aldo Amodeo