

DoE Report No DE-FG02-05ER63953**Support for Publication of the Proceedings of the 2004 International Radiation Commission**

Herbert Fischer

International Radiation Commission
Forschungszentrum Karlsruhe, Germany

This report is divided in four parts:

1. Brief introduction
2. Preface of the Proceedings
3. Acknowledgements of the Proceedings
4. Contents of the Proceedings

1. Brief introduction

The International Radiation Commission (IRC) is one of the ten commissions of IAMAS (International Association of Meteorology and Atmospheric Sciences). The IRC is composed of 41 members from 18 countries. Topics of current concern for the IRC include optical phenomena in the atmosphere, radiative properties of atmospheric constituents and the Earth surface, radiative transfer in atmospheres, radiant energy interaction with other features of the atmosphere (dynamics, climate etc.) and remote sensing of Earth and planetary atmospheres and surfaces.

An important activity of IRC, the International Radiation Symposium (IRS) is held every four years to promote atmospheric radiation studies. The last IRS took place in 2004 in Busan/Korea.

2. Preface of the Proceedings

The International Radiation Symposium (IRS 2004) on Current Problems in Atmospheric Radiation was held during August 23 till 28, 2004 at Busan Exhibition and Convention Centre (BEXCO), Busan, Korea. It was the first in Asia since IRS 1972 in Sendai/Japan.

The Symposium has been organized by the International Radiation Commission and hosted jointly by the Korean Meteorological Society (President: Dr. Hyo-Sang Chung) and the Centre of Atmospheric Environment Research of Seoul National University (Director: Prof. Dong-Kyou Lee). The conference focused on providing opportunities for exchanging advanced ideas and experiences on current problems in atmospheric radiation. It presented a platform for discussing and reviewing knowledge of spectroscopy, radiative transfer theory and modelling, remote sensing and weather and climate applications. The Symposium attracted about 340 scientists from 25 countries who presented approximately 370 papers in plenary and poster sessions.

The Symposium afforded an ideal opportunity to honour the first recipients of the Commission's new awards, the Gold Medal and the Young Scientist Award, which were presented to Professor Richard Goody of Harvard University and Dr. Toshihiko Takemura

of Kyushu University, respectively. The IRC Gold Medal is designed to honour a senior scientist who has made contributions of lasting significance to the field of radiation research. The IRC Young Scientist Award consists of a 500 US\$ cash award to a young scientist who has made recent noteworthy contributions to radiation studies and is regarded as becoming a leading radiation scientist in the future.

The proceedings of this conference are organized into the nine sessions of IRS 2004:

1. Topical Union Session
2. Radiative Transfer Theory and Modelling
3. Molecular Radiative Properties
4. Particle Radiative Properties
5. General Remote Sensing
6. Satellite Measurements (including Precipitation Measurements from Space)
7. Surface Measurements and Field Experiments
8. Radiative Budget and Forcing
9. Weather and Climate Applications

As at previous meetings, not all the authors provided manuscripts for these proceedings. Also, some of the submitted papers have not been accepted after the comprehensive reviewing process. Readers wishing copies of those not published here are encouraged to contact the corresponding author directly, using the address in the list of participants provided in this book.

We are looking forward to see you at the next International Radiation Symposium (IRS 2008) and to learn about your new research studies conducted during the coming years.

3. Acknowledgements of the Proceedings

We would like to thank all those who contributed to the success of IRS 2004. Special thanks are expressed to the Korean Meteorological Society (KMS, President: Dr. Hyo-Sang Chung) and the Atmospheric Environmental Research Institute of Seoul National University (Director: Prof. Dong-Kyou Lee) for serving as conference hosts, and Meci International, Inc. for supporting the organization of the symposium.

Appreciation is extended to the Local Organizing Committee (LOC), including the Chair Prof. Byung-Ju Sohn, the Co-Chair Prof. Young-Seup Kim, the Secretary Dr. Jae-Cheol Nam as well as the members of the Steering Committee (Prof. Jae H. Park (Seoul Natl. Univ.), Dr. Sung-Nam Oh (METRI/KMA), Prof. Jhoon Kim (Yonsei Univ.), Dr. Myoung-Hwan Ahn (METRI/KMA), Prof. Myoung-Seok Suh (Kongju Natl. Univ.), Prof. Jung-Moon Yoo (Ewha Womans Univ.), Prof. Chang-Hoi Ho (Seoul Natl. Univ.), Prof. Jae-Hwan Kim (Busan Natl. Univ.), Prof. Tae-Yong Kwon (Kangnung Natl. Univ.), and Prof. Kwang-Mog Lee (Kyungpook Natl. Univ.)) and the members of the Advisory Committee (Prof. Hi-Ku Cho (Yonsei Univ.), Prof. Chong-Heum Kwak (Kongju Natl. Univ.), Prof. Dong-Kyou Lee (Seoul Natl. Univ.), Prof. Jong-Ghap Jhun (Seoul Natl. Univ.), and Dr. Hong-Yul Paik (Korea Aerospace Research Institute)). LOC took care of the planning of the symposium, making arrangements in Busan, and running the symposium smoothly.

The Scientific Program Committee consists of the IRC officers (President Prof. Herbert Fischer (Germany), Vice-President Prof. Teruyuki Nakajima (Japan), Secretary Prof. Robert G. Ellingson (USA)), the chair of LOC (Prof. Byung-Ju Sohn) and the main conveners of the symposium sessions (Prof. Robert F. Cahalan (USA), Dr. Shepard A. Clough (USA), Dr. Jose Vanderlei Martins (USA), Prof. Yuriy M. Timofeyev (Russia), Prof. Jae H. Park (Korea), Prof. Atsumu Ohmura (Switzerland), Dr. Thomas Charlock (USA), and Dr. V. Ramaswamy (USA)). The Scientific Program Committee organized the nine sessions, arranged for the co-conveners for the sessions and solved the delicate

task of arranging the larger number of papers in a reasonable schedule of talks and poster presentations.

We thank also the responsible organizers of the accompanying program which gives some insight in the Korean culture and impresses particularly the colleagues from western countries.

The following national and international institutes, organisations and companies have sponsored IRS 2004: Seoul National University (SNU, Korea), BK21 School of Earth and Environmental Science of SNU (SNU/SEES, Korea), Climate Environment System Research Center (SNU, Korea), Korean Meteorological Research Institute (METRI/KMA, Korea), Korea Aerospace Research Institute (KARI, Korea), Forschungszentrum Karlsruhe (Germany), International Association for Meteorology and Atmospheric Sciences (IAMAS), Department of Energy (DoE, USA), EUMETSAT (Europe), Eko/Kipp & Zonen Alliance.

Their generous support of this symposium provided the financial resources to support the travel, registration fees, and local subsistence expenses for a considerable number of scientists who were not able to get adequate funding in their countries. Also, the publication of these proceedings became possible. Further supporting organisations were Busan Metropolitan City, Korea Meteorological Administration (KMA), Korea Science and Engineering Foundation (KOSEF) and Korea National Tourism Organization.

The organization of the proceedings was performed mainly by the Scientific Program Committee, of course with the help of many co-conveners of the sessions and further acknowledged scientists. We are grateful to Ms. Won-Ju Na, Mrs. Seong-Chan Park, Hyun-Jong Oh, Eui-Seok Chung, Keun-Hyuk Ryu, Hyoung-Wook Chun, Ho-Sun Park, Ms. Hye-Suk Park, Hyo-Jin Han, and Seung-Hee Ham, who provided editorial assistance of these proceedings, and to Ms. Diana McQuestion of Deepak Publishing Co., who supported us in preparing the manuscripts in a suitable form. Certainly, we thank all the contributors to these Proceedings.

4. Contents of the Proceedings

Preface

List of Participants

Session A: Topical Union Session

Convenors: Teruyuki Nakajima, Herbert Fischer, Robert G. Ellingson, and
Byung-Ju Sohn

Exploring aerosol-cloud-climate interaction mechanisms using the new generation of earth observation system data

Z. Li and T. Yuan

Three-dimensional radiative transfer

B. Mayer and T. Zinner

Atmospheric parameter retrievals from high resolution infrared spectra in a cloudy atmosphere

M. Höpfner

Session B: Radiative Transfer Theory and Modeling

Convenors: Robert F. Cahalan, Roger Davies, Peter Koepke, and
Manuel Lopez-Puertas

McScia: A Monte Carlo model for analysis of 3D features in a spherical atmosphere

F. Spada and M.C. Krol

The development of new radiation code for CCSR/NIES AGCM
M. Sekiguchi and T. Nakajima

Super fast radiative transfer model based on principal components
X. Liu, W.L. Smith, D.K. Zhou, and A.M. Larar

Modeling UV-exposure inside a plant canopy during a vegetation period
J.H. Schween and P. Koepke

Multiple Raman scattering in the Earth's atmosphere
R. van Deelen, J. Landgraf, and I. Aben

Stochastic radiative transfer in multilayer broken clouds: Approach, validation and application
E.I. Kassianov

Inferring domain-averaged cloud properties from the ARM observations and testing the PCLOS models
Y. Ma and R.G. Ellington

The value of limb measurements of the Earth's atmosphere
J.I. van Gent

The use of the ARM WSI to estimate the atmospheric optical depth at night
I.C. Musat and R.G. Ellingson

Convergence acceleration of a spherical harmonics method for strong anisotropic scattering
V.P. Boudak

Simulations of spectral actinic flux density fields in scattered and overcast cloud conditions: Comparison with INSPECTRO aircraft measurements
A. Kniffka, S.G. García, E. Jäkel, S. Schmidt, M. Wendisch, R. Scheirer, and T. Trautmann

Validation of a radiative transfer model for simulation of polarized radiances in a coupled ocean-atmosphere system
L. Duforet, P. Dubuisson, B. Bonnel, F. Parol, and M. Vesperini

A quasi-analytic solution of the radiative transfer equation for three-dimensional, heterogeneous atmospheres
H. Ishida and S. Asano

User-friendly software for satellite signal simulation based on line-by-line calculations of radiative fluxes in the atmosphere
J.C. Ceballos, B.A. Fomin, and M.P. Corrêa

A new technique for developing k-distributions
B.A. Fomin and M.P. Corrêa

Actual state of the UV radiation transfer model package STAR
P. Koepke, D. Anwender, M. Mech, A. Oppenrieder, J. Reuder, A. Ruggaber, M. Schreier, H. Schwander, and J. Schween

Altitude effect on UV index deduced from the VELETA-2002 experimental campaign (Spain)

J. Lorente, X. de Cabo, E. Campmany, Y. Sola, J. Gonzalez, J. Calbo, J. Badosa, L. Alados-Arboledas, A. Martinez-Lozano, V. Cachorro, A. Labajo, B. de la Morena, A.M. Diaz, M. Pujadas, H. Horvath, A.M. Silvia, and G. Pavese

About simulation of radiation transfer in smoky atmosphere and environmental monitoring

T.A. Sushkevich, S.A. Strelkov, E.V. Vladimirova, S.V. Maksakova, A.K. Kulikov and E.I. Ignatijeva

Development of the Monte-Carlo radiative transfer model Promt

U. Hamann, G. Seckmeyer, S. Raasch, and B. Mayer
Session C: Molecular Radiative Properties
Convenors: Shepard Clough, L. Rothman, and Jean-Marie Flaud

Theoretical calculation and simple parameterization for the water vapor millimeter wave foreign continuum

Q. Ma and R.H. Tipping

Theoretical calculation of the collision-induced absorption in dry air

R.H. Tipping and Q. Ma

Line strengths and half-widths of the N₂O bands in the 2.0- to 2.3 μm region at room temperature

M. Fukabori, T. Aoki, T. Fujieda, and T. Watanabe

Session D: Particle Radiative Properties

Convenors: J. Vanderlei Martins, Michel Legrand, and Jhoon Kim

Retrieval of aerosol optical properties from dual-wavelength polarization lidar measurements

T. Nishizawa, H. Okamoto, T. Takemura, N. Sugimoto, I. Matsui, and A. Shimizu

Thermal infrared radiometry, microphysical properties and geochemical nature of mineral dust

M. Legrand and O. Pancrati

Aerosols and molecules within cloudy atmosphere

I.N. Melnikova

Scaling properties of aerosol optical thickness retrieved from a long-term sun-photometer dataset

M. Alexandrov, A. Marshak, B. Cairns, A. Lacis, and B. Carlson

Radiative transfer modelling for evaluation of the parameterization of cloud optical properties in the Meso-NH mesoscale model

P. Dubuisson, J.P. Chaboureau, J.P. Pinty, and V. Giraud

The effects of nonsphericity and variation in ice crystal bulk density on 95 GHz cloud radar signals

K. Sato and H. Okamoto

Optical properties of particles from laboratory fires: Comparison between measurements and Mie calculations

K. Hungershofer, O. Schmid, R.S. Parmar, G. Helas, M.O. Andreae, K. Zeromskiene, Y. Iinuma, A. Wiedensohler, H. Herrmann, J. Trentmann, and T. Trautmann

A code to compute the direct solar radiative forcing: Application to anthropogenic aerosols during the ESCOMPTE experiment

P. Dubuisson, J.C. Roger, M. Mallet, and O. Dubovik

Numerical calculations of gravito-photophoretic movement for aerosol aggregates

A.A. Cheremisin and Y.V. Vassilyev

Session E: General Remote Sensing

Convenors: Yuriy M. Timofeyev, William L. Smith, and Kwang-Mog Lee

Multisensor ground-based remote sensing of radiatively important cloud parameters

S.Y. Matrosov

Observations of aerosols and clouds with Mie-lidar network

A. Shimizu, N. Sugimoto, and I. Matsui

Infrared spectral radiance validation using aircraft- and satellite-based sensor systems

A. M. Larar, W. L. Smith, D. K. Zhou, X. Liu, H. Revercomb, R. Knuteson, and S. A. Mango

Deriving a global surface albedo from geostationary observations

Y.M. Govaerts and A. Lattanzio

The atmospheric sensitivity of the airborne imaging spectrometer APEX

J.W. Kaiser, J. Nieke, D. Schläpfer, J. Brazile, and K.I. Itten

A near global climatology of cirrus overlapping water clouds and retrieval of cirrus cloud properties from MODIS

F.L. Chang and Z. Li

Quality, compatibility and synergy analyses of global aerosol products

M.J. Jeong, Z. Li, D.A. Chu, and S.-C. Tsay

Intercomparison of atmospheric parameters in the MLT region derived from the CRISTA-1 data by independent methods

V.S. Kostsov, Yu. M. Timofeyev, A.V. Rakitin, M. Kaufmann, O. Gusev, and K. Grossmann

Simultaneous retrieval of aerosol and surface properties over bright targets including snow and ice using multi- and hyperspectral data

W. Li, H. Eide, K. Stamnes, R. Spurr, T. Aoki, and M. Hori

Characterizing the atmosphere above turbid coastal waters using multi- and hyperspectral data

K. Stamnes, H. Eide, W. Li, R. Spurr, and J. Stamnes

Simultaneous retrieval of aerosols and in-water constituents in turbid coastal waters using multi- and hyperspectral data

H. Eide, W. Li, K. Stamnes, R. Spurr, and J. Stamnes

Comparison of satellite (TOMS, GOME) total ozone data with the measurements of Russian ground-based network

D.V. Ionov, Yu.M. Timofeyev, A.M. Shalamiansky, and J.C. Lambert

Development of a polarised radiative transfer model in the oxygen a-band for satellite retrieval of cloud top pressure

N. Fournier, P. Stammes, and M. Eisinger

Atmospheric and cloud parameters retrieval using IR spectral data

D.K. Zhou, W.L. Smith, H.L. Huang, J. Li, X. Liu, A.M. Larar, L. Chiou, and S.A. Mango

Fourier transform spectroradiometers for the characterization of the composition and the radiative properties of the upper atmosphere

L. Palchetti, G. Bianchini, B. Carli, F. Castagnoli, U. Cortesi, M. Pellegrini, and M. Trambusti

Retrieval of microphysical properties of mixed-phase clouds using active and passive sensors: A feasibility study for triple-band cloud radars at 9.4 GHz, 35 GHz, and 95 GHz

Y. Yoshida and S. Asano

Satellite-derived surface reflectance using the image-based atmospheric correction

K. Lee and Y. Kim

Characteristics of spectral emissivity for various types of surfaces derived from IMG spectrum data

Y. Ota and R. Imasu

Session F: Satellite Measurements, and

Session F-P: Precipitation Measurements from Space

Convenors: Jae H. Park, Johannes Schmetz, Michael D. King, W. Paul Menzel, Eric A. Smith, and Myoung-Hwan Ahn

Intra-seasonal variation of PSC compositions retrieved from ILAS-II data

Y. Kim, J.H. Park, W. Choi, K.M. Lee, S.T. Massie, T. Yokota, H. Nakajima, and Y. Sasano

Atmospheric infrared sounder on AIRS with emphasis on Level 2 products

S.-Y. Lee, E. Fetzer, S. Granger, T. Hearty, B. Lambrigtsen, E.M. Manning, E. Olsen, and T. Pagano

Earth reflectance spectra from 300-1750 nm measured by SCIAMACHY

P. Stammes, J.R. Acarreta, W.H. Knap, and L.G. Tilstra

Global comparison of MODIS and AVHRR-type aerosol retrievals over the ocean in the Terra/CERES-MODIS Single Scanner Footprint (SSF) data

T.X.P. Zhao and I. Laszlo

Aerosol and CO loading in the atmosphere observed by the MODIS and MOPITT-Russian forest fire case

J. Kim, S.H. Choi, H.C. Lee, H.K. Cho, D. Edwards, S.H. Lee, H.S. Lim, and G.H. Choi

Characteristics of satellite-observed MODIS data during foggy days near the Incheon international airport, Korea

Y.M. Kim and J.M. Yoo

First results from Meteosat-8: Atmospheric radiative properties from geostationary orbit

J. Schmetz, R. Borde, Y. Govaerts, K. Holmlund, M. König, and H.J. Lutz

A combined method of the TRMM precipitation radar and visible and infrared scanner for retrieval of cloud-precipitation interaction

T. Kobayashi and A. Adachi

Satellite-based tropical warm pool surface heat budgets: Contrasts between 1997/98 El Nino and 1998/99 La Nina

S.H. Chou, M.D. Chou, P.H. Lin, P.K. Chan, and K.H. Wang

A simple approach to estimate land surface albedo from satellite measurements

Y. Cui and T. Takamura

Application of -ASI to NAST-I

A. Carissimo, G. Grieco, C. Serio, V. Cuomo, G. Masiello, and W.L. Smith

A comparison of satellite derived precipitation fields and Meteosat-5 observations of mesoscale convective systems over Indian Ocean

T.F. Yang, I. Jobard, M. Capderou, and M. Desbois

Snow products derived from ADEOS-II/GLI data: Scientific implication

T. Aoki, M. Hori, A. Hachikubo, T. Tanikawa, H. Motoyoshi, Y. Iizuka, Y. Nakajima, F. Takahashi, K. Stamnes, W. Li, H. Eide, R. Storvold, and J. Nieve

Aerosol optical thickness in fair-weather cumulus in the Amazon region estimated from ASTER data

G. Wen and R.F. Cahalan

Remote sensing of stratospheric chlorine species with the MIPAS/ENVISAT-experiment

N. Glatthor, T. von Clarmann, H. Fischer, M. Höpfner, and G.P. Stiller

Radiative characteristics of cirrus clouds as retrieved from AVHRR

S. Katagiri and T. Nakajima

Determination of broadband emissivity for arid lands

T. Schmugge, K. Ogawa, and S. Rokugawa

Bright-band height statistics observed by the TRMM precipitation radar

K. Okamoto, H. Sasaki, E. Deguchi, M. Thurai, and K. Matsukawa

Effects of multiple scattering for millimeter-wavelength weather radars

S. Kobayashi, S. Tanelli, and E. Im

A combined TMI-SSM/I rainfall estimation technique for land surfaces over western Africa

J. Schulz, C. Simmer, and M. Diederich

Precipitation retrieval from dual-view spaceborne passive microwave radiometers
F.J. Turk, S.D. Michele, P. Bauer, F.S. Marzano, A. Mugnai, L. Roberti, and
A. Tassa

Session G: Surface Measurements and Field Experiments
Convenors: Atsumu Ohmura, Thomas Ackerman, Brent N. Holben, and
Guangyu Shi

Analysis of radiation measurements at the COVE sea platform
Z. Jin, T.P. Charlock, and K. Rutledge

Analysis of cloud variability and sampling errors in surface and satellite measurements
Z. Li, M.C. Cribb, F.-L. Chang, A. Trishchenko, and Y. Luo

UV-radiation and clouds: first results from the INSPECTRO project
R. Scheirer, B. Mayer, and S. Schmidt

REFIR measurements in the water vapour rotational band and comparison with a
BOMEM AERI-type Fourier transform spectrometer
F. Esposito, R. Restieri, C. Serio, V. Cuomo, G. Masiello, G. Pavese,
G. Bianchini, L. Palchetti, M. Pellegrini, T. Maestri, and R. Rizzi

Automated retrieval of atmospheric aerosol and trace gases properties from large
MFRSR datasets
M. Alexandrov, B. Carlson, A. Lacis, B. Cairns, and A. Marshak

Aerosol optical characteristics in Asia from measurements of SKYNET sky radiometers
K. Aoki, T. Nakajima, and T. Takamura

Optical properties of Asian dust measured at several sites in Japan
H. Kobayashi, K. Arao, T. Murayama, K. Iokibe, R. Koga, M. Yabuki, and
M. Shiobara

Automatic image recording network of sand storms and dusty airs in Northeast Asia
K. Kinoshita, N. Iino, S. Hamada, H. Kikukawa, T. Batmunkh, J. Dulam,
W. Ning, Z. Gang, and A. Tupper

Ground-based measurements of UV doses and ozone amounts using filter instruments
H. Eide, A. Dahlback, K. Stamnes, B.A. Høyskar, R.O. Olsen,
F.J. Schmidlin, S.C. Tsay, and J. Stamnes

New radiation and energy balance of the world and its variability
A. Ohmura

Continuous measurement of aerosol characteristics by ADEC sky-radiometer network
A. Uchiyama, A. Yamazaki, H. Togawa, and J. Asano

Aerosol optical depth measurement with MFRSR, UV-MFRSR, and sun photometer at
Gwangju, Korea
J.E. Kim and Y.J. Kim

Relationship between aerosol properties and air pollutants
S. Mukai, I. Sano, and M. Yasumoto

Retrieval of aerosol microphysical properties from MFRSR observations
E.I. Kassianov, J.C. Barnard, and T.P. Ackerman

Measurements of aerosol optical properties at Pallas Gaw station in northern Finland
V. Aaltonen, H. Lihavainen, J. Hatakka, and Y. Viisanen

Uncertainty analysis of data from the Polar Atmospheric Emitted Radiance Interferometer (PAERI) during the South Pole Atmospheric Radiation and Cloud Lidar Experiment (SPARCLE)
M.S. Town and V.P. Walden

Airborne measurements of upwelling and downwelling spectral actinic flux densities during the INSPECTRO campaign
E. Jäkel, M. Wendisch, S. Schmidt, T. Trautmann, and A. Kniffka

The French network for spectral measurement of solar UV irradiance
J. Lenoble, C. Brogniez, M. Houët, M. Legrand, J. Lenoble, A. de La Casinière, T. Cabot, and F. Guirado

UV filter radiometers: Calibration, field measurements and applications
A. Los

Comparison between observed spectral albedos and theoretical ones for artificial snowpack
T. Tanikawa, M. Aniya, T. Aoki, A. Hachikubo, M. Hori, and O. Abe

Correction of the diffuse influence in spectrodirectional measurements
J.T. Schopfer, S. Dangel, J.W. Kaiser, M. Kneubühler, J. Nieke, G. Schaepman-Strub, M.E. Schaepman, and K.I. Itten

The radiate and light characteristics of the climate change during the second half of 20th century in Moscow
G.M. Abakumova, E.V. Gorbarenko, E.I. Nezval, and O.A. Shilovtseva

Water vapor estimated with GPS on Tibetan Plateau and its influence on radiation budget
Z. Sun, J. Liu, and H. Liang

Validation experiment for satellite remote sensing and numerical models of 'YAMASE' clouds
M. Kojima, S. Asano, H. Iwabuchi, and S. Otake

Comparison of longwave effective cloud fraction with ARM cloudiness measurements
E.E. Takara and R.G. Ellingson

Session H: Radiative Budget and Forcing
Convenors: Thomas P. Charlock, Natalia Chubarova, Robert Kandel, and Kazuaki Kawamoto

All-sky aerosol direct forcing to SW and LW at TOA and surface using CERES Terra and the MATCH assimilation
T.P. Charlock, F.G. Rose, D.A. Rutan, D.W. Fillmore, and W.D. Collins

Long-term trend of surface shortwave radiation over China
T. Hayasaka, K. Kawamoto, J.Q. Xu, and G.Y. Shi

Aerosol optical/radiative forcing properties over East Asia determined from SKYNET radiation measurements
B.J. Sohn, D.H. Kim, T. Nakajima, and T. Takamura

AVHRR observations of the aerosol indirect effect for summertime stratiform clouds in the Northeastern Atlantic
M.A. Matheson, J.A. Coakley, and W.R. Tahnk

Estimates of the direct and indirect radiative forcing of climate by anthropogenic aerosols
J.A. Coakley, N.G. Loeb, T.P. Charlock, A.S. Ackerman, Y.J. Kaufman, and U. Lohmann

Satellite observations of cloud radiative forcing for the African tropical convective region
J.M. Futyran, J.E. Russell, and J.E. Harries

The visible and near infrared components of the shortwave radiation budget
I. Laszlo and R.T. Pinker

The NASA/GEWEX surface radiation budget dataset: Results and analysis
S.J. Cox, S.K. Gupta, J.C. Mikovitz, M. Chiacchio, T. Zhang, and P.W. Stackhouse

CM-SAF surface radiation budget: First results from the initial operations phase
R. Hollmann, R.W. Müller, and A. Gratzki

Global spherical model of Earth radiation in planet scale
T.A. Sushkevich, S.A. Strelkov, E.V. Vladimirova, A.N. Volkovich, V.V. Kozoderov, A.K. Kulikov, and S.V. Maksakova

UV radiation in past and future modelling with all atmospheric parameters including cloudiness
J. Reuder, P. Koepke, and J. Schween

Comparative study of UVB and total radiation attenuation observed in a South American region
M.P. Corrêa, J.C. Ceballos, M.J. Bottino, and G. Coronel

The influence of forest and peatbog fires on the optical and radiative regimes of the atmosphere and radiative forcing over Central Russia
N.Y. Chubarova, G.M. Abakumova, E.V. Gorbarenko, E.I. Nezval, O.A. Shilovtseva, and A.N. Rublev

Correspondence of the low cloud microphysics to the aerosol amount over China
K. Kawamoto, T. Hayasaka, and I. Uno

Session I: Weather and Climate Applications

Convenors: V. Ramaswamy, Jean-Jacques Morcrette, and Chang-Hoi Ho

Study of cloud microphysical structure with cloud profiling radar and lidar: Mirai cruise
H. Okamoto, T. Nishizawa, H. Kumagai, N. Sugimoto, T. Takemura, and T. Nakajima

Using satellite observations and reanalyses to evaluate climate and weather forecast models

R.P. Allan

Modes of tropical water cycle variability

J.J. Bates

Regional climate response induced by aerosol radiative forcing over Eurasia during boreal spring

M.K. Kim, W.S. Lee, K.M. Lau, K.M. Kim, Y.C. Sud, G.K. Walker, and M. Chin

Effective radius of cloud droplets by ground-based remote sensing: Implication to aerosol indirect effect

B.G. Kim

Simulation of climate change by aerosol direct and indirect effects with aerosol transport-radiation model

T. Takemura, T. Nakajima, and T. Nozawa

Signals of climate variations in the WCRP/GEWEX SRB datasets and their connections with other climate indices

T. Zhang, P.W. Stackhouse, S.K. Gupta, S.J. Cox, and C. Mikovitz