

International Radiation Symposium 2022

Detailed Programme

Monday, 4 July | 09:00 –10:30

E. Riadis Hall **Session 1: Topical Union Session: Current Problem in Atmospheric Radiation**

Chair: Alkiviadis Bais

09:15–09:45 **Welcome addresses**

09:45–10:15 **Keynote talk: Optical Reflections from Ancient Greece**

Christos Zerefos

10:15–10:30 **Presentation of WMO / Prof. Mariolopoulos trust fund award**

Juerg Luterbacher on behalf of the General Secretary of the World Meteorological Organization

10:30–11:00 **Coffee break**

Monday, 4 July | 11:00 –12:45

E. Riadis Hall **Session 4: General Remote Sensing**

Chair: Piet Stammes and Yasuko Kasai

11:00–11:15 **EarthCARE: Mission Performance and Preparations for Science Processing (381)**

***Invited**

Michael Eisinger, Dirk Bernaerts, Tobias Wehr, Kotska Wallace, Georgios Tzeremes and Alexander Hoffmann

11:15–11:30 **Future satellite mission preparation using synthetic data (161)**

Mathieu Compiègne, François Thieuleux, Philippe Dubuisson, Jérôme Riedi, Alessio Bozzo, Phil Watts, Mounir Lekouara and Christoph Straif

11:30–11:45 **A hyper-spectral system for static and aerial imagery (71)**

Melina Maria Zempila, Michelle Hamilton and Hugh Mortimer

11:45–12:00 **Terahertz Emission of the Lunar Surface: Forward Modelling (320)**

Suyun Wang, Takayoshi Yamada and Yasuko Kasai

12:00–12:15 **Estimating motion-induced error of 3MI's polarimetric measurements over inhomogeneous scenes (223)**

Souichiro Hioki, Jérôme Riedi and Mohamed S. Djellali

12:15–12:30 **Combined Retrieval from Ground Based and Space-borne Measurements: New Possibilities for Surface Validation and Beyond (258)**

Pavel Lytvynov, Oleg Dubovik, Cheng Chen, David Fuertes, Christian Matar, Benjamin Torres, Siyao Zhai, Anton Lopatin, Tatsiana Lapionak, Lukas Bindreiter, Verena Lanzinger, Andreas Hangler, Michael Aspetsberger, Christian Retscher, Alexandru Dandocsi and Daniele Gasbarra

12:30–12:45 **Evaluation of the quality of geophysical and instrumental parameters jointly retrieve from partially sampled interferograms (345)**

Sébastien Payan

M. Salties Hall 1 **Session 5: Ground-based Measurements and Field Observations**

Chair: Manfred Wendisch

11:00–11:15 **The Atmospheric Lidar Data Augmentation (ALiDAn) framework (417)**

Adi Vainiger, Suhbi Omer, Yoav Schechner, Zhenping Yin, Holger Baars, Birgit Heese and Dietrich Althausen

11:15–11:30 **Radiation measurements at the WMO/CIMO testbed site Lindenberg (265)**

Stefan Wacker, Lionel Doppler and Ralf Becker

11:30–11:45 **GBOV (Ground-Based Observation for Validation) – Network Development Status (361)**

Christophe Lerebourg, Gabriele Bai, Marco Clerici, Nadine Gobron, Luke Brown, Jadu Dash, Harris Morris and Darren Ghent

- 11:45–12:00 [Radiation and Remote Sensing Measurements at twin Stations Berlin/Lindenberg, a Comparison Analysis between a Suburban and a Rural site \(14\)](#)
Lionel Doppler, Lisa Marie Oehlschlägel, Robin Miri, Siiri Tunn and Jürgen Fischer
- 12:00–12:15 [Investigation of the annual cycle of the cloud radiative effect based on CERES and Polarstern observations during MOSAiC \(50\)](#)
Carola Barrientos-Velasco, Hartwig Deneke, Hannes J. Griesche, Anja Hünerbein, Andreas Macke, Patric Seifer, Matthew Shupe and Jonas Witthuhn
- 12:15–12:30 [Longwave Downward Radiation Trends in Switzerland \(36\)](#)
Laurent Vuilleumier, Stephan Nyeki, Julian Gröbner, Stefan Wacker, Christine Aebi and Giovanni Martucci

M. Saitiel Session 6: Radiation Budget and Forcing Hall 2

Chair: Seiji Kato

- 11:00–11:15 [A High Spectral Resolution Solar Reference Spectrum with TSIS-1 SIM Radiometric Accuracy \(340\)](#)
Odele Coddington, Erik Richard, Dave Harber, Peter Pilewskie, Tom Woods, Martin Snow, Kelly Chance, Xiong Liu and Kang Sun
- 11:15–11:30 [Understanding the Drivers of Recent Top-of-atmosphere \(TOA\) Radiation Changes Observed by the Clouds and the Earth's Energy System \(CERES\) \(136\)](#)
Norman Loeb, Tyler Thorsen and Ryan Scott
- 11:30–11:45 [Validation of 18 Years of Broadband Radiation Data from the Geostationary Earth Radiation Budget \(GERB\) Instruments \(51\)](#)
Christine Aebi, Nicolas Clerbaux, Edward Baudrez, Johan Moreels, Pierre de Buyl and Jacqueline Russell
- 11:45–12:00 [Observations of Seasonal Changes in the Arctic Energy Budget \(279\)](#)
Jonah Shaw and Jennifer Kay
- 12:00–12:15 [Evaluation of the new TOA radiation fields in the CM SAF CLARA-A3 Climate Data Record \(386\)](#)
Nicolas Clerbaux and Tom Akkermans
- 12:15–12:30 [Libera and Continuity of the ERB Climate Data Record \(174\)](#)
Peter Pilewskie and Maria Hakuba

M. Saitiel Session 2: Radiative Transfer Theory and Modeling Hall 3

Chair: Eli Mlawer

- 11:00–11:15 [The Full-Spectrum Correlated-k Method for Gas Optics: How fast can Radiation Schemes Get While Retaining Accuracy? \(272\)](#)
**Invited*
Robin Hogan and Marco Matricardi
- 11:15–11:30 [A Spectral Data Compression Hyperspectral Radiative Transfer Model \(348\)](#)
Chao Liu, Bin Yao and Mingyue Su
- 11:30–11:45 [Computationally efficient and accurate modelling of transmissivities of non-uniform paths through the Mixture I-distribution \(MLD\) approach \(17\)](#)
Frédéric Andre, Cindy Delage, Céline Cornet, Laurence Croize, Philippe Dubuisson and Mathieu Galtier
- 11:45–12:00 [Alternatives to Correlated K-Distributions for Radiative Transfer Calculations \(107\)](#)
Paulina Czarnecki, Robert Pincus and Lorenzo Polvani
- 12:00–12:15 [Approximate Methods of Radiative Transfer Theory for Solving Problems of Optical Remote Sensing \(234\)](#)
George Boos, Vladimir Budak, Dmitry Efremenko, Anton Grimailo and Alexander Kokhanovsky
- 12:15–12:30 [FASMAR - a new fast and accurate radiative transfer model \(293\)](#)
Linlu Mei, Vladimir Rozanov and John P. Burrows
- 12:30–12:45 [Innovative solution for fast radiative transfer in multiple scattering atmospheres at far and mid infrared wavelengths \(131\)](#)
Tiziano Maestri, Michele Martinazzo, William Cossich, Carmine Serio, Guido Masiello and Sara Venafrà
- 12:45–14:15 [Lunch break](#)

E. Riadis Hall **Session 4: General Remote Sensing**

Chair: Yasuko Kasai and Piet Stammes

- 14:15–14:30 **The Impact of Scattering on Long-Term Datasets from Microwave Sounders (10)**
Mathias Schreier, Bjorn Lambriqtsen and Evan Fishbein
- 14:30–14:45 **ESA's Ninth Earth Explorer mission FORUM - characterising the far-infrared spectrum of Earth's outgoing long-wave radiation (405)**
Hilke Oetjen, Luca Palchetti, Helen E Brindley, Stefan Buehler, Lieven Clarisse, Dorothee Coppens, Bianca M Dinelli, Laurent C.-Labonnote, Quentin Libois, Martin G Mlynzcak, Clémence Pierangelo, Marco Ridolfi, Martin Riese, Roger Saunders, Paolo Laberinti and Dirk Schuettemeyer
- 14:45–15:00 **A scale-aware forward model for simulating radar and lidar observations in NWP (410)**
Mark Fielding and Marta Janisková
- 15:00–15:15 **Inter comparison of satellite-based radiometer data with different band characteristics for quality estimation of level 1 data using a transfer function (384)**
Lena Jänicke, Rene Preusker, Dirk Schüttemeyer and Jürgen Fischer
- 15:15–15:30 **Global and Regional Entropy Production by Radiation Estimated from Satellite Observations (414)**
Seiji Kato and Fred Rose
- 15:30–15:45 **An evaluation of liquid cloud drop effective radius derived from MODIS, airborne remote sensing and in situ measurements over cumulus clouds (374)**
***Invited**
Dongwei Fu, **Larry Di Girolamo**, Robert Rauber, Greg McFarquhar, Stephen Nesbitt, Jesse Loveridge, Yulan Hong, Bastiaan van Dienenhoven, Brian Cairns, Mikhail Alexandrov, Paul Lawson, Sarah Woods, Simone Tanelli, Ousmane Sy, Sebastian Schmidt, Chris Hostetler and Amy Jo Scarino
- 15:45–16:00 **Cloud Macrophysical Changes Observed by MODIS, CALIPSO, and CloudSat for the 11-Year Period (16)**
Seung Hee Ham, Seiji Kato, Fred Rose, Norman Loeb, Kuan-Man Xu, Tyler Thorsen, Michael Bosilovich, Sunny Sun-Mack, Yan Chen and Walter Miller

M. Saltiel Hall 1 **Session 5: Ground-based Measurements and Field Observations**

Chair: Roberta Pirazzini

- 14:15–14:30 **Comparison of field and satellite data of the total cloud cover for the Atlantic ocean 2004-2014 (29)**
Alexey Sinitsyn, Marina Aleksandrova and Sergey Gulev
- 14:30–14:45 **Global Trends in Downward Surface Solar Radiation from Spatial Interpolated Ground Observations during 1961-2019 (101)**
***Invited**
Menghan Yuan, Thomas Leirvik and Martin Wild
- 14:45–15:00 **Long-term characterization of the Saharan Air layer (SAL) in a North Atlantic subtropical site (124)**
Africa Barreto, Emilio Cuevas, Rosa D. García, Judit Carrillo, Joseph M. Prospero, Luka Illic, Sara Basart, Alberto J. Berjón, Carlos L. Marrero, Yballa Hernández, Juan José Bustos, Slobodan Nickovic and Margarita Yela
- 15:00–15:15 **Long-Term Observations of Spectral Irradiance and Surface Albedo in Antarctica: Instrumental Challenges and Data Processing (360)**
Ghislain Picard, Sara Arioli, Laurent Arnaud and Quentin Libois
- 15:15–15:30 **Performance of in-situ FAPAR retrieval algorithms using synthetic canopy models and 3-D radiative transfer simulations (4)**
Christian Lanconelli, Jennifer Adams, Fabrizio Cappucci, Monica Robustelli and Nadine Gobron
- 15:30–15:45 **Estimating downward short-wave solar flux from all-sky RGB imagery using machine learning trained on DASIO dataset (81)**
Vasilisa Koshkina, Mikhail Krinitskiy, Nikita Anikin, Mikhail Borisov, Natalia Stepanova and Alexander Osadchiv

M. Saltiel Session 6: Radiation Budget and Forcing Hall 2

Chair: Norman Loeb

- 14:15–14:30 **Compelling Need for the Absolute Radiance Interferometer (ARI), an On-orbit SI Reference Sensor for IR Climate Data Uncertainty Reduction (192)**
Henry Revercomb, Fred Best, Joe Taylor, Dave Tobin, Jon Gero and Bob Knuteson
- 14:30–14:45 **The Polar Radiant Energy in the Far InfraRed Experiment (PREFIRE): A CubeSat Mission to Characterize the Full Spectrum of Polar Emission (139)**
Tristan L'Ecuyer, Brian Drouin, Brian Kahn, Nicole-Jeanne Schlegel, Sharmila Padmanabhan, Aronne Merrelli, Xianglei Huang, Jennifer Kay, Nathaniel Miller and Mary White
- 14:45–15:00 **Seasonal variability of the impact of Arctic low-level clouds on the surface radiative energy budget over sea ice and open ocean (69)**
Sebastian Becker, Johannes Stapf, André Ehrlich, Michael Schäfer and Manfred Wendisch
- 15:00–15:15 **High-latitude surface-atmosphere radiative coupling in the far-IR: missing physics in climate models and opportunities in future observations (22)**
Xianglei Huang, Ping Yang, Yi-Hsuan Chen, Xiuhong Chen, Wuyin Lin and Chongxing Fan
- 15:15–15:30 **Observations of aerosols, clouds and radiation in the NASA ORACLES project and their implications for future satellite missions (25)**
Jens Redemann, Lan Gao, Connor Flynn, Ian Chang, Feng Xu, Marcela Loria-Salazar, Emily Lenhardt, Abdulamid Fakoya, Logan Mitchell, Samuel LeBlanc, Kristina Pistone, Michal Segal-Rozenhaimer, Meloe Kacenenbogen, Sebastian Schmidt and Sabrina Cochrane
- 15:30–15:45 **On Measuring Earth's Energy Imbalance From Space (392)**
Maria Hakuba

M. Saltiel Session 2: Radiative Transfer Theory and Modeling Hall 3

Chair: Iouli Gordon

- 14:15–14:30 **Addressing Radiation, Cloud, Aerosol and Gas Uncertainties with the new Radiation Scheme ecRad in ICON (302)**
Sophia Schaefer, Martin Köhler, Robin Hogan, Daniel Rieger, Maike Ahlgrimm and Alberto de Lozar
- 14:30–14:45 **Utilization of Convolutional Neural Networks and Physics Informed NN to Retrieve Cloud and Aerosol Properties from Polarimetric Observations (233)**
Michal Segal Rozenhaimer, Kirk Knobelspiesse, Daniel Miller, Brian Cairns, Mikhail Alexandrov, Dmitry Batenkov, **Shai Zucker** and Hrushikesh Mhaskar
- 14:45–15:00 **Symbolic Monte Carlo applied to geometrical parameters of clouds in a remote sensing context (235)**
Mathieu Galtier, Frederic Andre, Céline Cornet, Philippe Dubuisson, Nicolas Ferlay, Maxime Roger and François Thieuleux
- 15:00–15:15 **A Functionalized Monte Carlo 3D Radiative Transfer Model: Radiative Effects of Clouds over Reflecting Surfaces (231)**
Najda Villefranque and Howard Barker
- 15:15–15:30 **Three Dimensional Radiative Transfer Effects in Numerical Weather Prediction and Large Eddy Simulations -- Methods and Impact on Cloud Evolution and Precipitation (399)**
Fabian Jakub and Bernhard Mayer
- 15:30–15:45 **Towards 3D Cloud Tomography from Space using Multi-Angle Imagery: Radiation Transport Regimes Inside & Outside an Opaque Cloud's Core (2)**
Anthony Davis, Linda Forster, K. Franklin Evans, Paul Von Allmen and **Bernhard Mayer**
- 15:45–16:00 **Spatiotemporal Optical Tomography of Cloud Microphysics by Overflying or Orbiting Cameras (150)**
Roi Ronen, Yoav Y. Schechner and Eshkol Eytan
- 16:00–16:30 **Coffee break**

E. Riadis Hall **Session 4: General Remote Sensing**

Chair: Jerome Riedi and Zhibo Zhang

- 16:30–16:45 **Validation of remotely-sensed cloud flag and cloud properties obtained from the GCOM-C (Shikisai) satellite SGLI sensor (19)**
Takashi Nakajima, Takashi Nagao, Masahiro Hori, Riko Higuchi, Haruma Ishida, Husi Letu, Nagai Shin, Kanta Shimizu and Tsukasa Eto
- 16:45–17:00 **Characterization of Cloud Interior Using Radon-Transform-based Tomographic Technique Applied to the Research Scanning Polarimeter Measurements Made During CAMP2Ex (32)**
Mikhail Alexandrov, Bastiaan van Diedenhoven, Brian Cairns and Andrzej Wasilewski
- 17:00–17:15 **Introduction to the new Airborne Thermal Infrared Imager VELOX for Remote Sensing of Cloud and Surface Properties. (100)**
Michael Schäfer, Kevin Wolf, André Ehrlich, Anna E. Luebke, Joshua Müller, Jakob Thoböll, Bjorn Stevens, Manfred Wendisch and Evelyn Jäkel
- 17:15–17:30 **Cloud occurrence on the Antarctic plateau: ground-based detection and satellite products (132)**
Tiziano Maestri, William Cossich, Michele Martinazzo, Gianluca Di Natale, Luca Palchetti, Giovanni Bianchini and Massimo Del Guasta
- 17:30–17:45 **Retrieval of the Dynamical Development of Clouds From Successive Simultaneous Stereo Satellite Images (157)**
Paolo Dandini, Céline Cornet, Renaud Binet, Laetitia Fenouil, Vadim Holodovsky, Yoav Y. Schechner, Didier Ricard and Daniel Rosenfeld
- 17:45–18:00 **Improving ice Cloud Properties Retrieval Using far-Infrared Satellite Measurements (160)**
Hélène Bresson, Laurent C.-Labonnote and Lucie Leonarski

M. Saltiel Hall 1 **Session 5: Ground-based Measurements and Field Observations**

Chair: Sebastian Schmidt

- 16:30–16:45 **Albedo based on surface properties retrieved from HELiPOD and Helicopter data during the MOSAiC campaign (91)**
Tim Sperzel, Evelyn Jäkel, Astrid Lampert, Falk Pätzold, Sophie Rosenburg, Gerit Birnbaum, Niklas Neckel, Hannah Niehaus and Manfred Wendisch
- 16:45–17:00 **Multi-Angle Cloud Detection to Improve Upon Heritage Radiance Thresholding under Low Radiance Contrast Conditions (138)**
Katey Dong and Sebastian Schmidt
- 17:00–17:15 **Total ozone uncertainty model implemented on Eubrewnet (166)**
Francisco Parra-Rojas, Alberto Redondas, Alberto Berjón, Javier López-Solano, Virgilio Carreño and Sergio F. León-Luis
- 17:15–17:30 **The Boundary-layer Air Quality-analysis Using Network of INstruments Supersite for Atmospheric Research and Satellite Validation (365)**
Stefano Casadio, Anna Maria Iannarelli, Annalisa Di Bernardino, Marco Cacciani, Monica Campanelli, Giampietro Casasanta, Enrico Cadau, Henri Diémoz, Cristiana Bassani, Gabriele Mevi, Anna Maria Siani, Massimo Cardaci, Angelika Dehn and Philippe Goryl
- 17:30–17:45 **Towards learning-based spatiotemporal lidar analysis aided by the Atmospheric Lidar Data Augmentation (ALiDAn) framework (421)**
Adi Vainiger, Omer Shubi, Yoav Schechner, Zhenping Yin, Holger Baars, Birgit Heese and Dietrich Althausen

M. Saltiel Hall 2 **Session 6: Radiation Budget and Forcing**

Chair: Nicolas Clerbaux

- 16:30–16:45 **Estimating the Earth's Outgoing Shortwave Radiance in the Lunar Direction (119)**
Jie Wu, Huadong Guo, Yixing Ding, Haulu Shang and Mingyang Lv
- 16:45–17:00 **How important is the transition zone between clouds and aerosol? (82)**
Josep Calbó, Josep-Abel González, Babak Jahani and Yolanda Sola
- 17:00–17:15 **The Longwave Cloud Twilight Zone- Radiative Signature in the So-called Clear Sky (171)**
Eshkol Eytan, Ilan Koren, Orit Altaratz, Alexander B. Kostinski and Ayala Ronen

- 17:15–17:30 [Sensitivity analysis of the transition zone between clouds and aerosols in radiative transfer models \(401\)](#)
Yolanda Sola, Josep Calbó and Josep-Abel González
- 17:30–17:45 [The ASTERIX space mission to monitor the Earth's energy imbalance \(444\)](#)
Luca Schifano, Lien Smeesters, Francis Berghmans and Steven Dewitte
- 17:45–18:00 [Aerosol Radiative Forcing and the Earth Energy Imbalance \(238\)](#)
Steven Dewitte

M. Salties **Session 2: Radiative Transfer Theory and Modeling**
Hall 3

Chair: Eli Mlawer

- 16:30–16:45 [An observation-based assessment of the subgrid cloud variability simulated by two stochastic cloud subcolumn generators \(75\)](#)
***Invited**
Lazaros Oreopoulos, Nayeong Cho, Dongmin Lee, Matthew Lebsock and Zhibo Zhang
- 16:45–17:00 [Optical Properties and Radiative Impacts of Clouds over East Asia \(341\)](#)
Bingqi Yi and Yuxiao Li
- 17:00–17:15 [An Efficient and Accurate Algorithm for Computing Grid-Averaged Solar Fluxes for Horizontally Inhomogeneous Clouds \(188\)](#)
Zhonghai Jin and Andrew Lacis
- 17:15–17:30 [Recent Advancements in the Numerical Computation of Surface Irradiance \(396\)](#)
Yu Xie and **Manajit Sengupta**
- 17:30–17:45 [Rooftop Solar Photovoltaic Energy Potential at Urban Environments: Application Example for the City of Athens in Greece \(112\)](#)
Panagiotis Kosmopoulos, Apostolos Katranitsas, Anastasios Tsavalos, Xinyuan Hou, Orestis Speyer, Stelios Kazadzis and Evangelos Gerasopoulos
- 17:45–18:00 [A Physics-based DNI Model Assessing All-sky Circumsolar Radiation \(397\)](#)
Yu Xie, **Manajit Sengupta**, Jaemo Yang and Yangang Liu

Tuesday, 5 July | 09:00 –10:30

E. Riadis Hall **Session 1: Topical Union Session: Current Problem in Atmospheric Radiation**

Chair: Peter Pilewskie and Marcia Akemi Yamasoe

- 09:00–09:30 **Keynote talk: Do cloud radiative feedbacks change spatial patterns of surface greenhouse warming and cooling?**
Jennifer E. Kay
- 09:30–10:00 **Keynote talk: How field observations can help to constrain models**
Manfred Wendisch, Jan Kretzschmar, Johannes Stapf, André Ehrlich, Michael Schäfer, Evelyn Jäkel, Kevin Wolf, Sebastian Becker, Marcus Klingebiel, Benjamin Kirbus, Hanno Müller, Johannes Röttenbacher and Elena Ruiz-Donoso
- 10:00–10:30 **Keynote talk: The use of satellite radiation measurements for forecasting the weather: Past, present and future**
Anthony McNally
- 10:30–11:00 **Coffee break**

Tuesday, 5 July | 11:00 –12:45

E. Riadis Hall **Session 4: General Remote Sensing**

Chair: Zhibo Zhang and Jerome Riedi

- 11:00–11:15 **The concept of universal retrieval algorithm for enhanced remote sensing of the atmosphere: GRASP-OPEN developments (104)**
*Invited
Oleg Dubovik, Pavel Litvinov, Tatyana Lapyonok, David Fuertes, Anton Lopatin, Fabrice Ducos, Benjamin Torres, Cheng Chen, Yevgeny Derimian, Milagros Herrera, Yana Karol, Marcos Herreras-Giralda, Christian Matar, Vanderlei Martins, Lorraine Remer, Reed Espinosa, Anin Puthukkudy, Lukas Bindreiter, Verena Lanzinger, Christoph Holter, Andreas Hangler and Michael Aspetsberger
- 11:15–11:30 **An Universal Approach to Atmospheric Correction of Short Wave Satellite Imagery, Implemented in Open Source Pytrol Package (102)**
Ronald Scheirer, Adam Dybbroe and Martin Raspaud
- 11:30–11:45 **Toward a Consistent Data Records from Coarse, Medium and High Spatial Resolution Earth Observation Satellites (178)**
Eric Vermote, Sergii Skakun and Jean-Claude Roger
- 11:45–12:00 **Libera's Split-shortwave Measurements and Their Application in Climate Research (400)**
Maria Hakuba, Peter Pilewskie and Graeme Stephens
- 12:00–12:15 **How AERIS atmosphere Data Centre contributes for atmospheric radiation studies (54)**
Sébastien Payan
- 12:15–12:30 **Eradiate: A New-Generation 3D Radiative Transfer Model for the Earth Observation Community (201)**
Vincent Leroy, Yvan Nollet, Sebastian Schunke, Nicolas Misk, Nadine Gobron, Christian Lanconelli, Ferra Gascon and Yves Govaerts

M. Salties Hall 1 **Session 5: Ground-based Measurements and Field Observations**

Chair: Roberta Pirazzini

- 11:00–11:15 **Observing Cloud Edges with Shortwave Spectrometers (87)**
Alexander Marshak, Guoyong Wen, Weidong Yang, Alexander Khain and Mark Pinsky
- 11:15–11:30 **The Representation of Arctic Mixed-Phase Clouds and Their Radiative Properties in ECMWF During ALOUD (94)**
Hanno Müller, Johannes Röttenbacher, Michael Schäfer, André Ehrlich and Manfred Wendisch
- 11:30–11:45 **Evaluation of ice optic parameterization on the radiative effect of Arctic cirrus in numerical weather prediction models (146)**
Johannes Röttenbacher, Hanno Müller, André Ehrlich, Anna Luebke, Michael Schäfer and Manfred Wendisch
- 11:45–12:00 **The observed impact and sensitivity of trade-wind cloud properties on cloud radiative forcing during EUREC4A (155)**
Anna Luebke, André Ehrlich, Michael Schäfer, Kevin Wolf and Manfred Wendisch

- 12:00–12:15 **Cloud Effects on Solar Actinic Radiation: Evaluation of Satellite-Aided RTM Calculations with Airborne HALO Measurements (209)**
Arthur Kremer, Birger Bohn, Rabindra Palikonda and William L. Smith Jr.
- 12:15–12:30 **Measurements of fog and smog microphysics, optical, and radiative properties on board of UAV and tethered balloon (329)**
Krzysztof Markowicz, Katarzyna Nurowska, Michał Chiliński and Grzegorz Florczyk
- 12:30–12:45 **Observation-based cloud radiative forcing over sea ice in the Weddell Sea, Antarctica, during summer (367)**
Roberta Pirazzini, Tiina Nygård, Timo Vihma, Milla Johansson and Jouko Launiainen

M. Saliel Session 6: Radiation Budget and Forcing Hall 2

Chair: Xianglei Huang

- 11:00–11:15 **Observational Evidence of Increasing Global Radiative Forcing (142)**
Ryan Kramer, Haozhe He, Brian Soden, Lazaros Oreopoulos, Gunnar Myhre, Piers Forster and Christopher Smith
- 11:15–11:30 **Size-Resolved Dust Direct Radiative Effect Efficiency Derived from Satellite Observations (213)**
Qianqian Song, Zhibo Zhang, Hongbin Yu, Jasper Kok, Claudia Di Biagio, Samuel. Albani and Jianyu Zheng
- 11:30–11:45 **Uncertainty of SW Cloud Radiative Effect in Atmospheric Models Due to the Parameterization of Liquid Cloud Optical Properties (354)**
Erfan Jahangir, Quentin Libois, Fleur Couvreur, Benoît Vié and David Saint-Martin
- 11:45–12:00 **An updated assessment of uncertainty in direct aerosol radiative effect and radiative forcing (420)**
Jon Elsey, Claire Ryder and Nicolas Bellouin
- 12:00–12:15 **Unraveling the Cause of Intermodel Spread in CO2 Forcing (190)**
Haozhe He, Ryan Kramer, Brian Soden and Nadir Jeevanjee
- 12:15–12:30 **Radiative Forcing and Hydrological Change: Greenhouse Gases versus Aerosols (20)**
Venkatachalam Ramaswamy
- 12:30–12:45 **Non-CO2 Forcers and their Climate, Weather, Air Quality and Health Impacts – New Project FOCI (435)**
Tomas Halenka

M. Saliel Session 2: Radiative Transfer Theory and Modeling Hall 3

Chair: Eli Mlawer

- 11:00–11:15 **Modelling of the Diurnal Cycle of the Aerosol-filled PBL with the Eddy Diffusivity/Mass Flux Model Coupled with the Radiative Transfer Model (422)**
Grzegorz M. Florczyk, Krzysztof Markowicz and Marcin L. Witek
- 11:15–11:30 **Modelling snow Optical Properties and Their Links to snow Microstructure (408)**
Alvaro Robledano Perez, Ghislain Picard, Marie Dumont, Laurent Arnaud and Frédéric Flin
- 11:30–11:45 **The fifth phase of Radiation Transfer Model Intercomparison: RAMI-V (5)**
Nadine Gobron, Christian Lanconelli and Mathias Disney
- 11:45–12:00 **Retrieving Land Surface Temperature from Thermal Infra-Red Spectra Generated with Generative Adversarial Networks and AutoEncoders Models. (129)**
Elisa Castelli, Enzo Papandrea, Alessio Di Roma, Ilaria Bloise, Mattia Varile, Hamid Tabani and Lorenzo Feruglio
- 12:00–12:15 **A new Correlated-k Mapping Technique for the Calculation of Photolysis, Photoionisation and Radiative Heating in the Far- to Extreme-Ultraviolet (18)**
James Manners
- 12:15–12:30 **A Parameterization of the CO2 15 μm non-LTE Cooling in the Middle Atmosphere (266)**
Manuel López-Puertas, Federico Fabiano, Victor Fomichev, Bernd Funke and Daniel Marsh
- 12:30–12:45 **Studying the magnetized X-ray parameters as measured through cyclotron resonance scattering features (70)**
Ali A. Taani
- 12:45–14:15 **Lunch break**

E. Riadis Hall **Session 4: General Remote Sensing**

Chair: Oleg Dubovik and Piet Stammes

- 14:15–14:30 **A Novel Approach to Solve the Forward/Inverse Problem in Remote Sensing Applications (185)**
Knut Stamnes, Wei Li, Yingzhen Zhou, Snorre Stamnes, Yongxiang Hu, Nan Chen, Yongzhen Fan, Børge Hamre and Jakob Stamnes
- 14:30–14:45 **Satellite 3D Radiance Simulator for the OCO-2 Mission and its Application to the Mitigation of Spectroscopy Retrieval Biases in the Vicinity of Clouds (193)**
Yu-Wen Chen and Sebastian Schmidt
- 14:45–15:00 **DISAMAR: an Algorithm for Determining Instrument Specifications and Analyzing Methods for Atmospheric Retrieval (210)**
Ping Wang, Johan De Haan, Maarten Sneep, Pepijn Veeffkind and Piet Stammes
- 15:00–15:15 **Integration of High-Performance Applications into GRASP General Retrieval Software. (12)**
David Fuertes, Oleg Dubovik, Fabrice Ducos, Tatyana Lapyonok, Pavel Litvinov, Anton Lopatin, Benjamin Torres, Yevgeny Derimian, Andreas Hangler and Michael Aspetsberger
- 15:15–15:30 **Fast high spectral resolution polarized radiative transfer with GPU based Monte-Carlo (221)**
Didier RaMonday, Mustapha Moulana and Mathieu Compiègne
- 15:30–15:45 **3D and 1D Radiative Transfer in EarthCARE: Radiative Closure Assessment and Radiative Products (362)**
Jason Cole, Howard Barger, Zhipeng Qu, Mark Shephard and Najda Villefranque
- 15:45–16:00 **EarthCARE Algorithms and Validation for Climate Change Studies (294)**
Hajime Okamoto, Kaori Sato, Eiji Oikawa, Masahiro Fujikawa, Tomoaki Nishizawa, Yoshitaka Jin, Makoto Aoki, Shoken Ishii, Yuichi Ohno, Hiroaki Horie, Maki Kikuchi and Hironori Iwai

M. Saltiel Hall 1 **Session 5: Ground-based Measurements and Field Observations**

Chair: Sebastian Schmidt

- 14:15–14:30 **Remote Sensing of Cloud Properties from Spectral and Polarimetric Imaging during the EUREC4A Field Campaign with specMACS (418)**
Veronika Pörtge, Anna Weber, Tobias Kölling, Linda Forster, Claudia Emde, Tobias Zinner and Bernhard Mayer
- 14:30–14:45 **Arctic cloud properties retrievals from UV-VIS-NIR data at the THAAO observatory, Thule, Greenland (125)**
Filippo Cali Quaglia, Daniela Meloni, Giovanni Muscari, Silvia Becagli, Marco Cacciani, Virginia Ciardini, Annalisa Di Bernardino, Tatiana Di Iorio, Giandomenico Pace, Charles Klingner and Alcide di Sarra
- 14:45–15:00 **Surface remote-sensing/in-situ measurements and retrievals of biomass-burning aerosol and trace gas properties over northern Thailand (436)**
Si-Chee Tsay, Ukkyo Jeong, Robert Swap, Brent Holben and Christina Hsu
- 15:00–15:15 **Detection of Dust Particle Orientation with a Solar Polarimeter (462)**
Vasiliki Daskalopoulou, Ioannis-Panagiotis Raptis, Alexandra Tsekeri, Vassilis Amiridis, Stelios Kazadzis, Zbigniew Ulanowski, Konstantinos Tassis and William Martin
- 15:15–15:30 **Characterizing dust aerosols with lidar and UAV-based measurements (Cyprus Fall campaign 2021) (466)**
Alkistis Papetta, Maria Kezoudi, Franco Marenco, Christos Keleshis, Jean Sciare, Danielle El Hajj, Yevgeny Derimian, Konrad Kandler, Joe Girdwood, Chris Stopford, Ru-Shan Gao and Frank Wienhold Gunther
- 15:30–15:45 **The impact of aerosol optical characteristics on the long-time UV index measurements in the urban area of Rome, Italy (84)**
Monica Campanelli, Henri Diemoz, Anna Maria Siani, Anna Maria Iannarelli, Rei Kudo, Gabriele Fasano, Giampietro Casasanta, Luca Tofful, Alcide di Sarra, Marco Cacciani, Paolo Sanò and Stefano Dietrich

M. Saltiel Hall 2 **Session 6: Radiation Budget and Forcing**

Chair: Martin Wild

- 14:15–14:30 **Worldwide Historical Evolution of Aerosol Optical Depth Derived From Sunshine Duration Measurements Since the Late 19th Century (103)**
William Wandji, Ville Leinonen, Antti Lipponen, Else van den Besselaar, Santtu Mikkonen, Arturo Sanchez-Iorenzo, Martin Wild, Doris Folini, Rei Kudo, Ben Liley, Raghav Srinivasan, Bruce Forgan, Alexandru Dumitrescu, Grzegorz

Urban, Michal Kowalewski, Marcia Yamasoe, Nilton Évora Do Rosário, Dimitra Founda, Stelios Kazadzis, Veronica Manara, Atsumu Ohmura and Antti Arola

14:30–14:45 **Indication of indirect aerosol effect on observed brightening at two alpine stations (96)**

Lucas Ferreira Correa, Martin Wild, Doris Folini and Boriana Chtirkova

14:45–15:00 **Evolution of the Aerosol Daily Direct Radiative Efficiency During the Pre-COVID-19 Decade Using the AERONET Database (260)**

Jean-Claude Roger, Yevgeny Derimian, Cecile Coeur, Eric Vermote, Natacha Kalecinski, Sergii Skakun, Oleg Dubovik, Chris Justice, Brent Holben, Bruno Korgo and Andres Santamaria

15:00–15:15 **Aerosol properties and aerosol–radiation interactions in clear-sky conditions over Germany for the period from 2010 to 2021 (86)**

Jonas Witthuhn, Anja Hünerbein, Florian Filipitsch, Stefan Wacker, Stefanie Meilinger and Hartwig Deneke

15:15–15:30 **Satellite-Observed Changes of Surface Radiative Properties due to Solar Farming and the Implication for Radiation Budget (23)**

Chongxing Fan and Xianglei Huang

15:30–15:45 **Utilizing the Spectral Dimension of Reflected Solar Radiation to Reveal Properties and Processes Controlling Variability in Earth's Albedo (73)**

Jake Gristey, Christine Chiu, Robert Gurney, Keith Shine, Stephan Havemann, Jean-Claude Thelen and Peter Hill

15:45–16:00 **Vertically resolved Aerosol Optical Properties and Direct Radiative Effects, at global scale, over a 40-year period (1980-2019) (413)**

Marios-Bruno Korras-Carraca, Antonis Gkikas, Arlindo Da Silva, Christos Matsoukas, Nikolaos Hatzianastassiou and Ilias Vardavas

M. Saitiel Session 2: Radiative Transfer Theory and Modeling Hall 3

Chair: Iouli Gordon

14:15–14:30 **HITRAN2020: Summary and Impact (441)**

Iouli Gordon, Laurence Rothman, Robert Hargreaves, Frances Skinner, Robab Hashemi, Ekaterina Karlovets, Roman Kochanov, Eamon Conway, Artem Finenko and Christian Hill

14:30–14:45 **Ab Initio Calculations of Line-Shape Parameters for Spectroscopic Databases (28)**

Piotr Wcisło

14:45–15:00 **Sampling molecular state transitions in a line-by-line Monte Carlo approach to estimate radiative forcing for climate change studies (170)**

Yaniss Nyffenegger-Pere, Stephane Blanco, Jean-Louis Dufresne, Mouna El Hafi, Vincent Eymet, Vincent Forest, Richard Fournier, Nicolas Mellado, Nada Chems Mourtaday and Mathias Paulin

15:00–15:15 **Comparison Study Between RTTOV-13 and 4A/OP v1.7 to Simulate IASI in Clear-sky Over Oceans (229)**

Jean-Marie Lalande, Raymond Armante, Jerome Vidot, Virginie Capelle and Pascale Roquet

15:15–15:30 **Recent analysis of water vapor continuum coefficients in the infrared window (424)**

Eli Mlawer, Jeana Mascio, David Turner and Vivienne Payne

15:30–15:45 **The ASPIC experiment - new laboratory observations of the water vapour continuum in the 2.1 and 1.6 μm windows (353)**

Jon Elsey, Damien Weidmann, Neil Macleod and Keith P. Shine

15:45–16:00 **Raman Scattering in the Earth's Atmosphere: Radiative Transport Simulations for Three Distinct Case-studies (380)**

Suniti Sanghavi and Christian Frankenberg

16:00–16:30 **Coffee break**

Tuesday, 5 July | 16:30 –18:15

Main hall Posters for Sessions 2 – 5

Posters are displayed for the entire duration of the Symposium and are accessible at all times.

Authors of posters for sessions 2–5 are expected to be present during this period to discuss their work.

For a list of posters see the Appendix.

Wednesday, 6 July | 09:00 –10:30

E. Riadis Hall **Session 1: Topical Union Session: Current Problem in Atmospheric Radiation**

Chair: Manfred Wendisch and Okamoto Hajime

09:00–09:30 **Keynote talk: The shaping of Earth's climate through the cycles of water and energy**
Graeme Stephens

09:30–10:00 **Keynote talk: Light Scattering by Non-spherical Atmospheric Particles: Brief History, Recent Advances and Applications**

Ping Yang and George Kattawar

10:00–10:30 **Keynote talk: Observing the Microscopic Living (and Non-Living) Ocean from Space**
Jeremy Werdell

10:30–11:00 **Coffee break**

Wednesday, 6 July | 11:00 –12:45

E. Riadis Hall **Session 4: General Remote Sensing**

Chair: Larry di Girolamo and Oleg Dubovik

11:00–11:15 **Investigation of Anomalous Transparent Clouds Based on Modis and Calipso Observations (212)**
Zhibo Zhang and Chamara Chamara Rajapakshe

11:15–11:30 **Vertical Retrieval of Cloud Optical Properties using Hyperspectral Measurements from AVIRIS: A stepping stone for CLARREO Pathfinder (252)**

Andrew Bugge and Peter Pilewskie

11:30–11:45 **Cloud height retrieval from TROPOMI oxygen A-band spectra – update of the FRESKO algorithm (167)**

Maarten Sneep, Ping Wang, **Piet Stammes**, Henk Eskes, Mark ter Linden and J. Pepijn Veefkind

11:45–12:00 **Ice cloud properties from high spectral resolution measurements in the thermal infrared: Application to IASI. (205)**

Lucie Leornaski, **Laurent C.-Labonnote**, Jérôme Vidot, François Thieuleux, Anthony Baran, Mathieu Compiègne and Philippe Dubuisson

12:00–12:15 **Impact of clouds on cloud-free sky radiances in a partially cloudy scenario. (176)**

Roberto Román, Daniel González-Fernández, Carlos Toledano, Claudia Emde, Victoria Cachorro, David Mateos, Sara Herrero-Anta, Juan Carlos Antuña-Sánchez, Ramiro González, Juan Carlos Antuña-Marrero, Bernhard Mayer, Abel Calle and Ángel de Frutos

12:15–12:30 **Cloud inhomogeneity and three-dimensional radiative transfer effects evaluated by a deep convolutional neural network (312)**

Hironobu Iwabuchi, Hana Kato and Sebastian Schmidt

12:30–12:45 **Cloud shadows in TROPOMI data (206)**

Victor Trees, Ping Wang, Piet Stammes, David Donovan, Pier Siebesma and L. Gijbert Tilstra

M. Salties Hall 1 **Session 5: Ground-based Measurements and Field Observations**

Chair: Manfred Wendisch

11:00–11:15 **La Palma Volcano Eruption: Characterisation of Volcanic Aerosols and Gas Emissions from a Synergetic Perspective (133)**

Africa Barreto, Omaira E. García, Roberto Román, Michael Sicard, Vincenzo Rizi, Reijo Roininen, Pedro M. Romero-Campos, Yenny González, Sergio Rodríguez, Rosa D. García, Carlos Torres, Marco Iarlori, Emilio Cuevas, Carmen Córdoba-Jabonero, Jesús de La Rosa, Alejandro Rodríguez-Gómez, Constantino Muñoz-Porcar, Adolfo Comerón, Andrés Bedoya-Velásquez, Juan Carlos Antuña-Sánchez, Vitaly Neustroev, Ermanno Pietropaolo, Jessica López-Darias, María-Ángeles López-Cayuela, Clara Carvajal-Pérez, Juan José Bustos, Óscar Álvarez, Carlos Toledano, C. Aramo, Jon Vilches, Ramiro González, A. Fernando Almansa, Romain Ceolato, Noemie Taquet, Natalia Prats, Alberto Redondas, Concepción I. Bayo, Ramon Ramos, Virgilio Carreño, Sergio L. León, Pedro Pablo Rivas, Antonio Alcántara, César López and Patricia Martín

11:15–11:30 **Vertical profiling of aerosols with drones, cable cars and skyscraper (382)**

Michal T. Chilinski, Krzysztof Markowicz and Katarzyna Nurowska

- 11:30–11:45 [A portable LED-based source for monitoring spectral responsivity changes of the AERONET Europe radiometers \(158\)](#)
Kerstin Schwind, Saulius Nevas, Stefan Pendsa and Philipp Schneider
- 11:45–12:00 [Evaluation of the Improved Langley Plot method through calibration transfer from the GAW-PFR network \(105\)](#)
Angelos Karanikolas, Natalia Kouremeti, Monica Campanelli, Victor Estellés and Stelios Kazadzis
- 12:00–12:15 [Tuneable laser-based calibration of filter radiometers from surface-based aerosol monitoring networks in Europe \(254\)](#)
Saulius Nevas, Kerstin Schwind, Philipp Schneider
- 12:15–12:30 [A Portable Tunable Radiation Source from UV to IR for in situ Calibration of Radiometers Measuring Aerosol Properties \(344\)](#)
Marek Smid, Geilnd Porrovecchio and Tim Bunitt

M. Salties Hall 2 Session 6: Radiation Budget and Forcing

Chair: Seung-Hee Ham

- 11:00–11:15 [Evaluating and Improving the Treatment of Gases in Radiation Schemes: The Correlated k-Distribution Model Intercomparison Project \(CKDMIP\) \(271\)](#)
Robin Hogan and Marco Matricardi
- 11:15–11:30 [A 3D Radiative Transfer Engine for Radiatively Consistent Retrievals of Cloud and Aerosol Properties for Future Satellite Missions \(262\)](#)
Sebastian Schmidt, Hong Chen, Vikas Nataraja and Jake Gristey
- 11:30–11:45 [Better Constraining Supercooled Clouds Could Reduce Projected Warming Spread \(457\)](#)
Gregory Cesana, Andrew Ackerman, Ann Fridlind, Israel Silber, Anthony Del Genio, Mark Zelinka and Helene Chepfer
- 11:45–12:00 [Monte Carlo methods for sensitivity estimates in atmospheric radiative transfer \(244\)](#)
Nada Chems Mourtaday, Stéphane Blanco, Jean-Louis Dufresne, Mouna El Hafi, Vincent Eymet, Vincent Forest, Richard Fournier, Paule Lapeyre, Najda Villefranque and Yaniss Nyffenegger-Péré
- 12:00–12:15 [Unforced inter annual variability of shortwave atmospheric absorption as seen by CMIP6 models \(330\)](#)
Boriana Chtirkova, Doris Folini, Lucas Ferreira Correa and Martin Wild
- 12:15–12:30 [Intermodel Spread in Instantaneous Radiative Forcing Across Multiple Climate Drivers \(141\)](#)
Ryan Kramer, Gunnar Myhre, Keith Shine, Haozhe He and Brian Soden

M. Salties Hall 3 Session 7: Weather, Climate and Environment Applications

Chair: Allen Huang and Xu Liu

- 11:00–11:15 [Towards a 3D view of Tropical Upper Tropospheric cloud systems from synergistic satellite observations and Machine Learning \(140\)](#)
***Invited**
Claudia Stubenrauch, Giulio Mandorli and Giacomo Caria
- 11:15–11:30 [Impact of Aerosol-PBL-Cloud Coupling and Interactions on Cloud, Precipitation and Thunderstorms \(224\)](#)
Zhanqing Li and Tianning Su
- 11:30–11:45 [Surface Solar Irradiance in Complex Cloud-Aerosol Environments: New Insights from Observations and High-Resolution Simulations \(72\)](#)
Jake Gristey, Graham Feingold, Ian Glenn, Sebastian Schmidt and Hong Chen
- 11:45–12:00 [Evaluation of the direct aerosol effect and the effects of aerosol-cloud interaction on solar irradiance, cloudiness and surface temperature according to the simulations using the INMCM48 climate model \(342\)](#)
Aleksei Poliukhov, Natalia Chubarova and Evgenii Volodin
- 12:00–12:15 [Radiative budget and diabatic heating decomposition by Cloud Vertical Structure regimes \(77\)](#)
Dongmin Lee, Lazaros Oreopoulos and Nayeong Cho
- 12:15–12:30 [Improved cloud scattering parameterization for Mid and Far-IR in RTTOV \(95\)](#)
Jerome Vidot, Laurent C.-Labonnote, James Hocking and Jean-Marie Lalonde
- 12:30–12:45 [SPARTACUS-Surface: Representing the 3D Interaction of Radiation with Urban Areas and Forests for Weather and Climate Applications \(268\)](#)
Megan Stretton, Robin Hogan, William Morrison and Sue Grimmond
- 12:45–14:15 [Lunch break](#)

E. Riadis Hall **Session 4: General Remote Sensing**

Chair: Ping Wang and Suniti Sanghavi

- 14:15–14:30 **CloudCT 3D volumetric tomography (317)**
Vadim Holodovsky, Masada Tzabari, Yoav Y Schechner, Eshkol Eytan, Orit Altaratz, Ilan Koren and Klaus Schilling
- 14:30–14:45 **Synergistic Retrieval of Cloud Properties from the 3MI and its Companion Instruments Aboard METOP-SG A (446)**
Jérôme Riedi, Laurent C.-Labonnote, Nicolas Ferlay, Souichiro Hioki, Nicolas Henriot, François Thieuleux, Mathieu Compiègne, Aurélien Chauvigné, Céline Cornet, Simonne Guilbert, Lucie Leonarski, Fabien Waquet, Frédéric Parol, Philippe Dubuisson, Bertrand Fougnie and Thierry Marbach
- 14:45–15:00 **On the Variability and Changes of Cloud Regimes over Central Europe Based on 14 Years of Satellite data (310)**
Vasileios Tzallas, Anja Hünerbein, Martin Stengel, Jan Fokke Meirink, Nikos Benas, Jörg Trentmann and Hartwig Deneke
- 15:00–15:15 **Cloud detection and classification algorithms for Himawari-8 imager measurements based on deep learning (332)**
Wenwen Li, **Feng Zhang**, Han Lin, Xiaoran Chen, Jun Li and Wei Han
- 15:15–15:30 **Solar radiance constraints on liquid cloud from EarthCARE used to improve rain retrievals and top-of-atmosphere radiative closure (357)**
Shannon Mason, Robin Hogan, Zhipeng Qu, Jason Cole and Howard Barker
- 15:30–15:45 **Synergistic Use of Visible Stereoscopy and Thermal Infrared Techniques for Estimating Cirrus Properties in Multi-layered Scenes from Terra (359)**
Arka Mitra, Jesse Ray Loveridge, Larry Di Girolamo, Yulan Hong, Yizhe Zhan and Kevin J. Mueller
- 15:45–16:00 **Satellite observations of tropical trade cumuli during the EUREC4A campaign (411)**
Hartwig Deneke, Oscar Ritter, Andi Walther and Andrew Heidinger

M. Saltiel Hall 1 **Session 3: Particle Radiative Properties**

Chair: Ping Yang

- 14:15–14:30 **The use of quartz crystal microbalance (QCM) in the study of the dynamics of aerosol particles in the relative humidity field (60)**
Victor Oshlakov
- 14:30–14:45 **A new Application of the Boundary Element Method to Compute the Single-Scattering Properties of Complex ice Crystals in the Microwave (128)**
***Invited**
Anthony Baran, Antigoni Kleanthous, Timo Betcke, David Hewett and Christopher Westbrook
- 14:45–15:00 **Comparing assumed dust optical properties in Goddard-based satellite algorithms and models (187)**
***Invited**
Robert Levy, Patricia Castellanos and Peter Colarco
- 15:00–15:15 **Light Scattering Matrix for Preferential Oriented Atmospheric ice Crystals for Solving the Radiation Transfer Equation (295)**
Alexander Konoshonkin, Victor Shishko, Tatiana Zhuravleva, Ilmir Nasrtdinov, Natalia Kustova and Anatoli Borovoi
- 15:15–15:30 **Interpretation of Space-borne Lidar Signals of Ice Clouds (296)**
***Invited**
Hajime Okamoto, Kaori Sato, Anatoli Borovoi, Hiroshi Ishimoto, Kazuhiko Masuda, Alexander Konoshonkin and Natalia Kustova
- 15:30–15:45 **On the estimation of key Cloud Parameters from Satellite: an Artificial Intelligence-based retrieval framework (336)**
Pietro Mastro, Domenico Cimini, Filomena Romano, Elisabetta Ricciardelli, Francesco Di Paola, Salvatore Larosa, Tim Hultberg, Thomas August, Carmine Serio and Guido Masiello
- 15:45–16:00 **Implications of particles asphericity for aerosol remote sensing in thermal infrared (368)**
Yevgeny Derimian, Marcos Herreras-Giralda, Alexander Kostinski, Oleg Dubovik, Tatyana Lapyonok and Pavel Lytvynov

M. Salties **Session 6: Radiation Budget and Forcing**
Hall 2

Chair: Bill Smith

- 14:15–14:30 **3D Radiative Heating of Upper Tropospheric Cloud Systems in relation to Convective Organization deduced from synergistic satellite observations and Machine Learning (151)**
Giulio Mandorli and Claudia Stubenrauch
- 14:30–14:45 **Subgrid-Scale Topographic Effects on Radiation for Global Weather Forecast Models (30)**
Sunghye Baek
- 14:45–15:00 **A radiative evaluation of the GEOS global model based on MODIS cloud regimes (76)**
Dongmin Lee and Lazaros Oreopoulos
- 15:00–15:15 **Dynamics of the global energy budget with a time dependent climate feedback parameter (162)**
Robin Guillaume-Castel, Benoit Meyssignac, Rémy Roca and Jonathan Chenal
- 15:15–15:30 **The nonlinearity in climate feedbacks (182)**
Yi Huang
- 15:30–15:45 **The uncertainty of Surface Radiation Budget measurements (55)**
Julian Gröbner, Christian Thomann, Ibrahim Reda, David D. Turner, Moritz Feierabend, Chrisian Monte, Allison McComiskey and Max Reiniger
- 15:45–16:00 **Attribution of Surface Radiation Trends Over the Western North Atlantic Ocean (454)**
Allison McComiskey, Jung Min Park and David Painemal

M. Salties **Session 7: Weather, Climate and Environment Applications**
Hall 3

Chair: Allen Huang and Zhanqing Li

- 14:15–14:30 **The Impact of Cloud Radiative Effects on Tropical Tropopause Layer Temperature and Troposphere-Stratosphere Transport (461)**
*Invited
Qiang Fu
- 14:30–14:45 **Two Perspectives of Ice Microphysical Impact on Cloud-Radiative Heating (467)**
Sylvia Sullivan, Aiko Voigt, Christian Rolf, Annette Miltenberger and Martina Krämer
- 14:45–15:00 **Identifying Synoptic Circulation Patterns and Their Influence on Solar Irradiance Intermittence by means of Self-Organizing Maps (52)**
Julián Cañellas, Facundo Orte, Elian Wolfram and Alejandro D. Otero
- 15:00–15:15 **Radiative effects of urban aerosol in the atmosphere of Moscow megacity according to the mesoscale COSMO-ART model and measurements (301)**
Natalia Chubarova, Elizaveta Androsova, Alexander Kirsanov, Gdalyi Rivin, Bernhard Vogel, Heike Vogel, Olga Popovicheva, Alexei Poliukhov and Ekaterina Zhdanova
- 15:15–15:30 **The new Cloud Climate Data Record CLAAS-3: Evaluation of Cloud Optical and Microphysical Properties (423)**
Nikos Benas, Jan Fokke Meirink and Martin Stengel
- 15:30–15:45 **Solar Resource Assessment and Forecasting Using CAMS-MACC and Physical Modeling in Tropical Climate (246)**
Akriti Masoom, Panagiotis Kosmopoulos, Ankit Bansal and Stelios Kazadzis
- 15:45–16:00 **Assimilation of satellite retrievals for dust modeling applications (484)**
Stavros Solomos, Christos Spyrou, Nikolaos Bartsotas, Petros Katsafados and Slobodan Nickovic
- 16:00–16:30 **Coffee break**

Wednesday, 6 July | 16:30 –18:15

E. Riadis **Session 4: General Remote Sensing**
Hall

Chair: Suniti Sanghavi and Ping Wang

- 16:30–16:45 **Validation and Improvement of Synthetic Retrievals of 3D Cloud Properties Using Multi-Angle Passive Imagery and 3D Radiative Transfer (387)**
Jesse Loveridge and Larry Di Girolamo
- 16:45–17:00 **Delving deeper into the spatiotemporal features of cloud and meteorological state imprinted on geostationary satellite images (318)**

- Hironobu Iwabuchi**, Xinyue Wang and Takaya Yamashita
 17:00–17:15 **Cloud Droplet Number Concentration: Satellite Retrievals Improved by Advanced Atmospheric Modelling (415)**
Alexandre Siméon, Jessenia Gonzalez and Odran Sourdeval
- 17:15–17:30 **3D volumetric tomography of in-lab cloud-cells (426)**
Masada Tzabari, Vadim Holodovsky, Yoav Y Schechner, Noa Raifler, Ofer Yaron, Omer Shubi, Tamar Klein and Liam Hazan

M. Saltiel **Session 3: Particle Radiative Properties**
Hall 1

Chair: Ping Yang

- 16:30–16:45 **Introducing Single-particle Angular Light Scattering Measurements for Validation of ice Crystal Optical Models (404)**
Franz Schnaiter, Emma Järvinen, Shawn Wagner and Guanglang Xu
- 16:45–17:00 **Ice crystal morphological complexity and asymmetry parameter: implications for light scattering measurement (431)**
Guanglang Xu, Martin Schnaiter, Emma Järvinen and Shawn Wagner
- 17:00–17:15 **Observational Perspective on ice Cloud Asymmetry Parameter in Short-wave (403)**
Emma Järvinen, Martin Schnaiter, Guanglang Xu and Shawn Wagner
- 17:15–17:30 **Exploring the synergy of lidars and spectrophotometers and its potential to separate aerosol species and improve trace gas profiling (452)**
Nikolaos Siomos, Dimitris Karagkiozidis, Ilias Fountoulakis, Fani Gkertsis, Dimitris Nikolis, Kalliopi A. Voudouri, Konstantinos Michailidis, Katerina Garane, Angelos Karanikolas, Athanasios Natsis, Alkiviadis F. Bais and Dimitris Balis

M. Saltiel **Session 7: Weather, Climate and Environment Applications**
Hall 3

Chair: Jhoon Kim

- 16:30–16:45 **Validation of Solar Resource Parameters Simulated by SMART-G, in Clear-sky Conditions (172)**
Thierry Elias, Mustapha Moulana, Gabriel Chesnoiu, Isabelle Chiapello and Nicolas Ferlay
- 16:45–17:00 **Experimental radiosondes for solar radiation accounting for upper-air sondes temperature sensors (281)**
Fedor Zagumennov, Vladimir Fomenko, Alexei Lykov, Andrey Bystrov and Maxim Philippov

Thursday, 7 July | 09:00 –10:30

E. Riadis Hall **Session 1: Topical Union Session: Current Problem in Atmospheric Radiation**

Chair: Byung-Ju Sohn

09:30–10:00 **Invited talk by the Gold medal awardee**

10:00–10:30 **Invited talk by the Young Scientist awardee**

10:30–11:00 **Coffee break**

Thursday, 7 July | 11:00 –12:45

E. Riadis Hall **Session 4: General Remote Sensing**

Chair: Helen Worden and Bastiaan van Diedenhoven

11:00–11:15 **Challenges in development of a NASA VIIRS-Like Cloud Property Algorithms for Next Generation Geostationary Imagers (438)**

Robert Holz, Edwin Eloranta, Kerry Meyer, Steve Platnick, Nandana Amarasinghe, Gala Wind, Steve Ackerman, Andrew Heidinger, Steve Dutcher and Richard Frey

11:15–11:30 **Lessons learned from the updated GEWEX Cloud Assessment database (203)**

Claudia Stubenrauch and Stefan Kinne

11:30–11:45 **First Year Observations of Air Quality from Geostationary Environment Monitoring Spectrometer (GEMS) (230)**
***Invited**

Jhoon Kim, Dongwon Lee, Myoung-Hwan Ahn, Hanlim Lee, Jae H Kim, Rokjin Park, Chul H. Song, Sang-Woo Kim, Si-Wan Kim, Jongmin Yoon, Won-Jin Lee, Hyunkee Hong, Chang-Suk Lee, Wonjun Choi, Yuha Kim, Kyung-Jung Moon, Dai Ho Ko, Seung-Hoon Lee, Heesung Chong, Sujung Go, Sang Seo Park, Yeseul Cho, Seoyoung Lee, Hana Lee, Mina Kang, Mijin Eo, Juseon Bak, Kanghyun Baek, Dae Sung Choi, Hyeong-Ahn Kwon and Gems Science Team

11:45–12:00 **Aerosol Layer Height from high-resolution TROPOMI O2-A band reflectance measurements. (168)**

Martin de Graaf, Swadhin Nanda, Maarten Sneep, Mark Ter Linden and Pepijn Veeffkind

12:00–12:15 **An Improved Aerosol Retrieval for Himawari-8/AHI using GRASP algorithm (232)**

Chong Li, Oleg Dubovik, Jing Li, David Fuertes, Anton Lopatin, Pavel Litvinov, Tatyana Lapyonok, Lukas Bindreiter and Christian Matar

12:15–12:30 **Accounting for aerosol particle nonsphericity in active and passive remote sensing of desert dust using GRASP algorithm (241)**

Anton Lopatin, Oleg Dubovik, Wushao Lin, Lei Bi, Masanori Saito, Gregory Schuster, Syiao Zhai, Moritz Haarig, Albert Ansmann, Pavel Litvinov, Chong Li, Cheng Chen, Christian Matar, David Fuertes and Yana Karol

12:30–12:45 **Aerosol Mineralogical and Microphysical Study from Laboratory to Satellite Remote Sensing IASI Measurements: Application to East Asian Deserts (250)**

Perla Alalam and Hervé Herbin

M. Salties Hall 1 **Session 8: Solar UV Radiation**

Chair: Ann Webb and Stelios Kazadzis

11:00–11:15 **Thirty years of solar ultraviolet spectral irradiance measurements in Thessaloniki: Variability and trends (251)**

Katerina Garane, Ilias Fountoulakis, Angelos Karanikolas, Alkiviadis F. Bais and Charikleia Meleti

11:15–11:30 **The UV Index in the 21st Century over Thessaloniki, Greece, from Measurements and Simulations in Relation to the Montreal Protocol (8)**

Angelos Karanikolas, Athanasios Natsis, Ilias Fountoulakis, Dimitris Karagkiozidis, Charikleia Meleti, Kleareti Tourpali and Alkiviadis Bais

11:30–11:45 **Climatological Aspects of Melanoma Incidence Increase in Europe (24)**

Agnieszka Czerwińska and Janusz Krzyściń

11:45–12:00 **Imputation methods for UV monitoring data gaps (33)**

Felix Heinzl, Sebastian Lorenz and Daniela Weiskopf

- 12:00–12:15 **25 years of solar UV monitoring in Dortmund, Germany – data processing and trend analysis of UV index values and daily erythemal UV dose (34)**
Sebastian Lorenz, Felix Heinzl, Marco Janßen, Stefan Bauer, Ingo Mayer and Daniela Weiskopf
- 12:15–12:30 **Solar UV irradiance measurements as validation for satellite derived UV maps (56)**
Julian Gröbner, Gregor Hülsen, Mario Blumthaler and Luca Egli
- 12:30–12:45 **A Long-term Dose-Response Relationship for 25-hydroxyvitamin D, and How to Apply it in Different Climates (59)**
Ann Webb, Richard Kift and Rehab Alghamdi

M. Saltiel **Session 6: Radiation Budget and Forcing**
Hall 2

Chair: Sebastian Schmidt

- 11:00–11:15 **Recent Developments in Surface Solar Dimming and Brightening (93)**
Martin Wild
- 11:15–11:30 **The Global Dimming and Brightening Based on MERRA-2 Reanalysis data and its Evaluation Against GEBA & BSRN Ground-Based Networks (269)**
Michael Stamatidis, Nikolaos Hatzianastassiou, Marios Bruno Korras Carraca, Christos Matsoukas, Martin Wild and Ilias Vardavas
- 11:30–11:45 **Next Generation Ocean Radiation Measurement Best Practices for a Unified Global Surface Radiation Budget Network (143)**
Laura Riihimäki, Meghan Cronin, R. Venkatesan, Alcide Giorgio di Sarra and Cheng Xue
- 11:45–12:00 **Assessment of surface radiative closure based on the EarthCARE satellite mission and a dense network of radiative flux measurements (416)**
Hartwig Deneke, Sebastian Bley, Anja Hünerbein, Andreas Macke, Marion Schroedter-Homscheidt, Stefanie Meilinger and Jonas Witthuhn
- 12:00–12:15 **Improved Nocturnal Cloud Properties Derived from Satellite Data Using Machine Learning: Impact on Surface Longwave Flux Estimates (248)**
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- 12:15–12:30 **Evaluation and Analyse of Downwelling Surface Solar Irradiance Estimates by Heliosat-V From Fengyun-2G/S-VISSR (406)**
Xuemei Chen, Benoît Tournadre, Benoît Gschwind, Yves-Marie Saint-Drenan and Philippe Blanc
- 12:30–12:45 **Importance of Satellite Viewing Geometries for the Estimation of Downwelling Surface Solar Irradiance: a Case Study on Heliosat 2, SARA and Heliosat-V (407)**
Benoît Tournadre, Xuemei Chen, Yves-Marie Saint-Drenan, Benoît Gschwind and Philippe Blanc

M. Saltiel **Session 7: Weather, Climate and Environment Applications**
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- 11:15–11:30 **Satellite-derived climate data records of the surface solar irradiance provided by the CM SAF (319)**
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- 11:30–11:45 **Climate Data Record Derived from Hyperspectral Satellite Remote Sensors (255)**
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- 11:45–12:00 **A Novel new Coupled two-Moment Parameterisation for Cirrus Radiative Properties and its Impact in a Cloud-Aerosol Resolving Model (127)**
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- 12:00–12:15 **Accounting for Several Infrared Radiation Processes in Climate Models (327)**
Kun Wu, Jiangnan Li, Jason Cole, Xianglei Huang, Knut Von Salzen and Feng Zhang
- 12:30–12:45 **Solar irradiance ramp events forecasting based on all-sky imagers (304)**
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E. Riadis Hall **Session 4: General Remote Sensing**

Chair: Bastiaan van Dienenhoven and Helen Worden

- 14:15–14:30 **Polarimetric remote sensing of the atmosphere in the UV-VIS: Modeling scattering and absorption by Brown Carbon (191)**
Jacek Chowdhary, Hans Moosmuller, Gregory Schuster, Kostas Tsigaridis, Matteo Ottaviani and Snorre Stamnes
- 14:30–14:45 **Satellite Detection of UV Absorbing Aerosols by TROPOMI – Methodology and Results (169)**
Piet Stammes, Maurits Kooreman, Martin de Graaf, L. Gijsbert Tilstra, Deborah Stein Zweers, Maarten Sneep, Mark ter Linden, Victor Trees, Ping Wang and J. Pepijn Veeffkind
- 14:45–15:00 **Toward dust microphysical property retrievals from lidar observations (43)**
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- 15:15–15:30 **Satellite Observations of Cloud-Related Variations in Aerosol Properties (90)**
Tamas Varnai, Alexander Marshak, Thomas Eck, Guoyong Wen, Weidong Yang and Robert Levy
- 15:30–15:45 **Synergic Retrieval of Atmospheric Aerosol Properties Using Solar and Thermal Infrared Spectrum (300)**
Marcos Herreras Giralda, Oleg Dubovik, Yevgeny Derimian, Pavel Lytvynov, Tatsiana Lapionak and David Fuertes
- 15:45–16:00 **Advances on aerosol retrieval from geostationary weather satellites using AERUS-GEO (333)**
Xavier Ceamanos, Bruno Six, Dominique Carrer, Adèle Georgeot, Jérôme Riedi, Suman Moparthy, Josef Gasteiger and Jean-Luc Attié

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Chair: Andreas Kazantzidis and Kaisa Lakkala

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- 14:30–14:45 **A Satellite-Derived High-Resolution UV Climatology for Public Health (113)**
Laurent Vuilleumier, Todd C. Harris, Athanasios Nenes, Claudine Backes and David Vernez
- 14:45–15:00 **The Ultraviolet Index Operating System (UVIOS): Application Example and Validation in the European Region (120)**
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- 15:00–15:15 **Combining model, satellite and ground-based measurements for analysing UV variability and trends (148)**
Axel Kreuter, Verena Schenzinger, Barbara Klotz and Michael Schwarzmann
- 15:15–15:30 **Direct Solar UV Measurements from Array Spectroradiometer to Retrieve Total Column Ozone (149)**
Luca Egli, Julian Gröbner, Herbert Schill and René Stübi
- 15:30–15:45 **UV Spectral Data for Wind Turbine Blade Coating Degradation Machine Learning Simulations (7)**
Kristian Pagh Nielsen
- 15:45–16:00 **Ground-based measurements of total ozone column amount with a multi-channel UV instrument at the Troll Research Station, Antarctica (186)**
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M. Saltiel Hall 2 **Session 6: Radiation Budget and Forcing**

Chair: Maria Hakuba

- 14:15–14:30 **The Impact of Drifting Orbits on Monthly Regional TOA Flux Observations from the Clouds and the Earth's Radiant Energy System (CERES) (163)**

David Doelling, **Norman Loeb** and Cathy Nguyen

14:30–14:45 **Toward a Seamless Earth Radiation Budget Climate Data Record Across Multiple Satellite Missions (135)**

Norman Loeb, Seiji Kato, Fred Rose, David Doelling, Wenying Su, William Smith and Mohan Shankar

14:45–15:00 **A Spatiotemporally Continuous Satellite-Based Surface Radiation Budget Dataset: Validating the GEWEX SRB Release 4-IP Results Against Multiple Surface-Based Datasets (109)**

Taiping Zhang, Paul Stackhouse, Stephen Cox and Colleen Mikovitz

15:00–15:15 **Evaluation of reanalysis temperature and humidity profiles for producing surface radiative flux climate record (239)**

Seiji Kato, Norman Loeb, Seung-Hee Ham, Fred Rose, Sunny Sun-Mack, William Smith, Xianglei Huang, Michael Bosilovich and Allison Collow

15:15–15:30 **Air-sea heat fluxes based on homogenizing 20th century visually observed cloud cover over the Ocean (85)**

Marina Aleksandrova and Sergey Gulev

M. Saltiel Hall 3 Session 10: Climate Change in the Mediterranean and Radiative Impacts of a Changing Environment

Chair: Michael Sicard, Nikos Hatzianastasiou

14:15–14:30 **Impact of Extreme Wildfires of August 2021 on Air Quality and Solar Irradiance in Greece (214)**

***Invited**

Kostas Eleftheratos, Dimitra Kouklaki, Ilias Fountoulakis, Ioannis-Panagiotis Raptis, Dimitra Founda, Stelios Kazadzis, Basil Psiloglou, Vassilis Amiridis, Eleni Marinou and Christos Zerefos

14:30–14:45 **The Effect of Large Dust Size on Solar Radiation Fluxes (464)**

Alexandra Tsekeri, Vassilis Amiridis, Maria Tsihla, Ilias Fountoulakis, Angelos Nersesian, Emmanouil Proestakis, Antonis Gkikas, Kyriakoula Papachristopoulou, Vasileios Barlakas and Stelios Kazadzis

14:45–15:00 **Infrared radiative effects of desert dust in the Mediterranean during the long dust season of summer 2021 (460)**

Giorgia Proietti Pelliccia, Tatiana Di Iorio, Daniela Meloni, Francesco Monteleone, Giandomenico Pace, Damiano Sferlazzo, Fabrizio Anello, Salvatore Piacentino and **Alcide di Sarra**

15:00–15:15 **Total Aerosols and Pure Dust Induced Perturbations on Downwelling Surface Solar Radiation over the Mediterranean Basin (324)**

Kyriakoula Papachristopoulou, Ilias Fountoulakis, Antonis Gkikas, Panagiotis Kosmopoulos, Panagiotis Nastos, Maria Hatzaki and Stelios Kazadzis

15:15–15:30 **Climatology of aerosol optical properties and broad band radiation measured at the Cyprus Atmospheric Observatory, a regional background site of the Eastern Mediterranean (468)**

Danielle El Hajj, Yevgeny Derimian, Michael Pikridas, Isabelle Jankoviak, Franco Marengo, François Dulac and Jean Sciare

15:30–15:45 **Vertically resolved dust direct effect during the intense Mediterranean dust aerosol episode of 16 June 2016 (291)**

Maria Gavrouzou, Nikos Hatzianastassiou, Marios-Bruno Korras-Carraca, Christos Lolis, Christos Matsoukas, Nikos Michalopoulos and Ilias Vardavas

15:45–16:00 **Evaluation of satellite-derived surface irradiance in Greece using reference surface measurements (289)**

Jörg Trentmann, Basil Psiloglou, Alkiviadis Bais and Athanasios Natsis

16:00–16:15 **Physical Retrieval of Sea Surface Temperature with SEVIRI infrared measurements: Application to the Mediterranean in the last decade (343)**

Guido Masiello, Carmine Serio, Sara Venafra, Angela Cersosimo, Francesco Falabella, Pietro Mastro, Pamela Pasquariello and Antonio Pepe

16:00–16:30 **Coffee break**

Thursday, 7 July | 16:30 –18:15

Main Hall Posters for Sessions 6–10

Posters are displayed for the entire duration of the Symposium and are accessible at all times.

Authors of posters for sessions 6–10 are expected to be present during this period to discuss their work.

For a list of posters see the Appendix.

M. Saltiel **Session 8: Solar UV Radiation**
Hall 1

Chair: Julian Grobner and Sebastian Lorenz

- 09:00–09:15 **Surface Solar Spectral ultraviolet Irradiance in Italy: The Influence of Geopotential Height and Lower-Stratospheric Ozone (237)**
Ilias Fountoulakis, **Henri Diémoz**, Anna Maria Siani, Alcide di Sarra, Daniela Meloni and Damiano M. Sferlazzo
- 09:15–09:30 **UV radiation measurements at Arctic and Antarctic sites: results from Sodankylä (67°N) and Marambio (64°S) (290)**
Kaisa Lakkala, Margit Aun, Ricardo Sanchez, Jukka Kujanpää, Antti Arola, Germar Bernhard, Yanina García Skabar, Seppo Hassinen, Anu Heikkilä, Juha M. Karhu, Tomi Karppinen, Hanne Suokanerva and Johanna Tamminen
- 09:30–09:45 **Measurements of solar UV exposure distributions in the head/neck region and the efficiency of skin cancer prevention measures (315)**
Peter Knuschke
- 09:45–10:00 **Vitamin D Synthesis: Seasonal Availability and Climatology of Vitamin D3 Irradiance for 2 sites in England (334)**
Richard Kift, Ann Webb, Andrew Smedley and John Rimmer
- 10:00–10:15 **Air Quality Applications of Satellite-Based UV Radiation Observations (352)**
Anu-Maija Sundström, Antti Arola, Antti Lipponen, Jukka Kujanpää, Markku Kulmala and Johanna Tamminen
- 10:15–10:30 **Standardization of UV Irradiance as a Function of Shortwave Radiation (395)**
Aron Habte and **Manajit Sengupta**

M. Saltiel **Session 4: General Remote Sensing**
Hall 2

Chair: Jhoon Kim and Lorraine Remer

- 09:00–09:15 **Retrieving Aerosol Characteristics from the PACE Ocean Color Instrument: Making Use of the UV Through the Shortwave Infrared (346) *Invited**
Lorraine Remer, Shana Mattoo, Woogyung Victor Kim, Vinay Kayetha, Omar Torres, N. Christina Hsu, Robert Levy, Hiren Jethva, Yingxi Rona Shi and Jaehwa Lee
- 09:15–09:30 **Retrieval of aerosol water fraction, dry size distribution and soluble fraction using multi-angle polarimetry (450)**
Bastiaan van Diedenhoven, Otto Hasekamp, Snorre Stamnes, Brian Cairns and Luke Ziemba
- 09:30–09:45 **Assessment of aerosol - ice cloud interactions from a joint satellite - reanalysis framework (369)**
Odran Sourdeval, Edward Gryspeerd, Martina Krämer and Johannes Quaas
- 09:45–10:00 **Aerosol and Cloud Measurements with the HARP Family of HyperAngular Imaging Polarimeters (439)**
J. Vanderlei Martins, Anin Puthukkudy, Noah Sienkiewicz, Xiaoguang Xu, Brent McBride, Roberto Fernandez-Borda, Henrique Barbosa, Lorraine Remer and Oleg Dubovik
- 10:00–10:15 **Multi-sensor Aerosol Product (MAP) from Sensors On-board the EPS-SG Satellites (445)**
Soheila Jafariserajehlou, Bertrand Fougnie, Thierry Marbach, Andriy Holdak and Margarita Vázquez-Navarro
- 10:15–10:30 **Intercomparison of machine learning techniques for the retrieval of aerosol optical depth from solar irradiance measurements (215)**
Stavros-Andreas Logothetis, Vasileios Salamalikis and Andreas Kazantzidis

M. Saltiel **Session 9: Ocean Optics**
Hall 3

Chair: Jeremy Werdell

- 09:00–09:15 **Imaging Earth's Living Ocean (430)**
***Invited**
Paula Bontempi and Michael Behrenfeld
- 09:15–09:30 **An atmospheric correction scheme for lakes and nearshore coastal waters (40)**
Nima Pahlevan, Brandon Smith and Peng-Wang Zhai
- 09:30–09:45 **CDOM Absorption Properties of Natural Water Bodies Along Extreme Environmental Gradients (194)**
Ciren Nima, Øyvind Frette, Børge Hamre, **Jakob Stamnes**, Yi-Chun Chen, Kai Sørensen, Marit Norli, Daren Lu, Qianguo Xing, Dennis Muyimbwa, Taddeo Ssenyonga, Knut Stamnes and Svein Rune Erga
- 09:45–10:00 **A new synthetic database generated by radiative transfer simulations in support of studies in ocean optics and optical remote sensing (338)**

Hubert Loisel, Daniel Schaffer Ferreira Jorge, Rick Reynolds and Dariusz Stramski

10:00–10:15 **Optical Properties and Hydrolight simulations of the NW Levantine Sea during the PERLE-2 cruise (326)**
Spyridon Chaikalis, Andrew Clive Banks, Aikaterini Kikaki, Sarantis Sofianos, Panagiotis G Drakopoulos, Nektarios Spyridakis, Stella Psarra, Vincent Taillandier, Fabricio D Ortenzio and Aristomenis P. Karageorgis

10:15–10:30 **Evaluating the BRDF correction for a new semi-analytical model using field measurements. (335)**
Alberto Tonizzo, Srinivas Kolluru and Michael Twardowski

10:30–11:00 **Coffee break**

Friday, 8 July | 11:00 –12:45

M. Salties Hall 1 **Session 8: Solar UV Radiation**

Chair: Julian Grobner and Sebastian Lorenz

11:00–11:15 **Albedo retrieval from UV measurements in alpine environments (427)**
Michael Schwarzmann, Verena Schenzinger, Barbara Klotz and Axel Kreuter

11:15–11:30 **Hale cycle in solar hemispheric UV radiation (428)**
Kalevi Mursula

M. Salties Hall 2 **Session 4: General Remote Sensing**

Chair: Lorraine Remer and Jhoon Kim

11:00–11:15 **Satellite observations of tropospheric ozone long-wave radiative effect (LWRE) (97)**
*Invited

Helen Worden, Kevin Bowman, Stamatia Doniki and Le Kuai

11:15–11:30 **Water vapor content retrieval in cloudy sky conditions from SWIR satellite observations using multi-angular information (39)**

Raphaël Peroni, Céline Cornet, Olivier Pujol, Guillaume Penide and Clémence Pierangelo

11:30–11:45 **Snow surface reflectance in NIR and SWIR in the context of space-based greenhouse gas remote sensing (377)**
Antti Mikkonen, Hannakaisa Lindqvist, Jouni Peltoniemi, Janne Hakkarainen and Johanna Tamminen

11:45–12:00 **XCO₂ retrievals from OCO-3 SAM mode observations using BALSAMIC (379)**
Suniti Sanghavi and Christian Frankenberg

12:00–12:15 **Fusion of Remote Sensing Measurements over Greenland and Polarimetric Retrieval of Surface and Atmospheric Parameters (99)**

Matteo Ottaviani, Nan Chen, Gabriel Myers, Iraz Tejani, Kathleen Powell and Jerome Riedi

12:15–12:30 **Simultaneous estimation of winter Arctic sea ice thickness and snow depth from satellite radiometer measurements (2003-2020) (313)**

Hoyeon Shi, Sang-Moo Lee, Byung-Ju Sohn, Gorm Dybkjær, Rasmus T. Tonboe, Albin J. Gasiewski and Walter N. Meier

12:30–12:45 **Reliable Ground Displacement Analysis with Synthetic Aperture Radar Interferometry: The decorrelated test case of the Basilicata region, Italy (257)**

Francesco Falabella, Carmine Serio, Guido Masiello and Antonio Pepe

M. Salties Hall 3 **Session 9: Ocean Optics**

Chair: Jeremy Werdell

11:00–11:15 **Relevance of Radiative Transfer Approximation for Forward Model and Inversion Scheme for Retrieval of Optically Active Water Constituents (243)**

*Invited

Tristan Harmel, Guillaume Morin, Pierre Gernez, Laura Zoffoli, Manuela Grippa, Laurent Kergoat, Elodie Robert and Jean-Michel Martinez

11:15–11:30 **Sentinel-3 OLCI L2 Ocean Colour Collection-3 and ongoing developments (378)**
Ewa Kwiatkowska, David Dessailly, Juan Ignacio Gossn and Estelle Obligis

Appendix

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Linda Forster, Anthony B. Davis, David J. Diner and Bernhard Mayer

152 Monte-Carlo simulations of Active and Passive remote sensing instruments within a highly resolved 3D cloudy atmosphere.

Guillaume Penide, Frédéric Szczap, Celine Cornet, Alaa Alkasem and Julien Delanoe

179 Local Estimate Method with 3D Objects in the SMART-G Radiative Transfer Monte-Carlo code

Mustapha Moulana, Didier Ramon, Céline Cornet, Thierry Elias and Robert Frouin

208 Backscattering Halo in Media with Highly Elongated Phase Scattering Functions

Yaroslav Ilyushin and Vladimir Mrerzlikin

226 The Development of an Extensible Three-Dimensional Radiative Transfer Model

Ken Hirata, Miho Sekiguchi, Yousuke Sato and Masaru Inatsu

328 Improvements of the Radiation Scheme “MstrnX”

Miho Sekiguchi and Teruyuki Nakajima

331 Simulation of Emission Temperature and Emissivity of Winter Arctic Sea Ice for Microwave Temperature Sounding Band and its Impact on 1D-Var

Eui-Jong Kang, Byung-Ju Sohn and Rasmus tage Tonboe

370 New Vectorial Version of the Second Simulation of the Satellite Signal in the Solar Spectrum, 7S

Jean-Claude Roger, Eric Vermote, Philippe Dubuisson, José Luis Villaescusa Nadal, Andrès Santamaria Artigas, Natacha Kalecinski, Sergii Skakun and Chris Justice

393 The 3-D effect of stratocumulus-cumulus clouds on the surface irradiance as estimated by Monte Carlo RTM simulations.

Jorge Rosas Santana and Marcia Akemi Yamasoe

425 Solar Radiative Transfer Simulations of Horizontally Oriented ice Particles

Vasileios Barlakas and Andreas Macke

Session 3. Particle Radiative Properties

48 Vertical Profile of the Aerosol Direct Radiative Effect in an Alpine Valley, by the Synergy of Ground-based Measurements and Radiative Transfer Models.

Gabriele Fasano, Henri Diémoz, Claudio Cassardo, Ilias Fountoulakis, Rei Kudo, Monica Campanelli and Victor Estellés

144 On the effects of microstructure and spatial orientation of ice particles on the radiative properties of cirrus clouds

Tatiana Zhuravleva

277 Light scattering properties of atmospheric aggregated ice particles within the geometrical optics approximation

Dmitriy Timofeev, Alexander Konoshonkin, Natalia Kustova, Viktor Shishko and Anatoli Borovoi

284 Negative polarization near the backscattering direction by large particles

Natalia Kustova, Anatoli Borovoi, Alexander Konoshonkin, Victor Shishko, **Dmitriy Timofeev** and Nadezhda Kan

286 Backscattering Properties of Atmospheric ice Crystals of Irregular Shape in the Optical and Microwave Range

Iliia Tkachev, Victor Shishko, Dmitriy Timofeev, Alexander Konoshonkin, Natalia Kustova and Anatoli Borovoi

321 Cloud and Precipitation Retrievals from Space-borne Doppler Cloud Profiling Radar

Kaori Sato, Eiji Oikawa, Hiroshi Ishimoto and Hajime Okamoto

351 Sensitivity study of high spectral resolution measurements in the mid and far IR to hydrometeor’s shape mixtures: A new microphysical model parametrisation.

Laurent C.-Labonnote, Jérôme Vidot, Hélène Bresson and Jean-Marie Lalande

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Andrew Smedley, Ann Webb, Paul Connolly, Omer Celebi, Evelyn Hesse, Joseph Ulanowski, Anthony Baran and Alejandro Bodas-Salcedo

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89 Publicly Available Online Simulator of 3D Radiative Processes

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123 Retrieval of aerosol properties from zenith sky radiance measurements

Sara Herrero, Roberto Roman, David Mateos, Juan Carlos Antuña-Sánchez, Carlos Toledano, Fernando Almansa, Ramiro Gonzalez, Marcos Herreras-Giralda, Daniel González-Fernández, Victoria Eugenia Cachorro and Ángel Máximo de Frutos

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Minseok Kim, Jhoon Kim, Hyunkwang Lim, Seoyoung Lee and Pak Wai Chan

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Dongxu Yang

200 Numerical simulation of microwave radiometry sensing of broken cumulus cloud fields from space.

Dobroslav Egorov, Yaroslav Ilyushin, Boris Kutuza and Yaroslav Koptsov

219 SI-traceable characterization of a Lunar Precision Filter-Radiometer

Natalia Kouremeti, Saulius Nevas, Stelios Kazadzis, Julian Gröbner, Philipp Schneider and Kerstin Schwind

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Tatiana Russkova and Ilya Tkachev

228 Traceable radiometric characterization and uncertainty budget development of spectroradiometer designed for solar spectral data acquisition.

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256 The Thermal Infrared Optical Depth of Mineral Dust Retrieved from Integrated CALIOP and IIR Observations

Jianyu Zheng, Zhibo Zhang, Anne Garnier, Hongbin Yu, Qianqian Song, Chenxi Wang, Philippe Dubuisson and Claudia Di Biagio

276 GOCI-II Yonsei Aerosol Retrieval (YAER): Algorithm and validation

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285 Air quality improvements during the quarantine period due to Covid-19 in Europe using passive remote sensing techniques

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412 Extending Deep Blue aerosol products from LEO to GEO sensors

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433 Development of in-flight characterization methods for the Multiviewing, Multichannel and Multipolarisation Imaging (3MI) mission.

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476 Sensitivity Analysis of H₂O Retrieval in Asia from Geostationary Environment Monitoring Spectrometer

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478 Retrieving Spectral Aerosol Absorption and Speciation from DSCOVR EPIC

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Session 5. Ground-based Measurements and Field Observations

1 TREND OF SUNSHINE HOURS AND CLOUDINESS IN THE NORTHEAST OF THE ANTARCTIC PENINSULA

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Christian Lanconelli and Laura Riihimäki

31 Innsbruck's Aerosol Climate

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