International DOAS Workshop

Thessaloniki, Greece 9-11 July 2025

Detailed Programme

Wednesday, 9 July

08:00-09:10 **Registration**

09:10-09:20 **Welcome and logistics**

Session 1: Ground-based remote sensing

Chair: Michel Van Roozendael, Pinhua Xie

09:20–09:40 **Point-Sampling and Open-Path Ancillary Observations in the Context of MAX-DOAS Measurements During the CINDI-3 Campaign (52)**
Johannes Lampel, Stefan Schmitt, Martin Horbanski, Denis Pöhler, Erna Frins and Roberto Barragán

09:40–10:00 **CINDI-3: Results from the Semi-blind DSCD Inter-comparison and Comparisons with data from the FRM4DOAS Centralised Processed data (64)**
Martina Michaela Friedrich, Karin Kreher and Michel Van Roozendael

10:00–10:20 **Ammonia Concentration Monitoring Using long-path UV DOAS (48)**
Stijn Berkhout, Mark Eijkelboom, Kevin Felter, René van der Hoff, Marty Haaima, Thomas Kotte and Bas Spilt

10:20–10:40 **Ground-based Total Ozone Column Measurements in the Huggins and Chappuis Bands Using Direct-Sun DOAS Observations (58)**
Dimitris Karagkiozidis, Katerina Garane, Michel Van Roozendael

10:40–11:10 **Coffee break**

11:10–11:30 **DOAS Retrievals with a Hyperspectral Imager Scanning in Wavelength: The NO2 Camera (56)**
Pierre Gramme, Cedric Busschots and Emmanuel Dekemper

11:30–11:50 **Two Decades of DOAS Measurements in the Canadian High Arctic and Two New Instruments (67)**
Kimberly Strong, Ramina Alwarda, Darby Bates, Orfeo, Colebatch, Pierre Fogal, Kevin Joshy and Xiaoyi Zhao

11:50–12:10 **Conversion of Pandora Direct Sun NO2 Columns to Surface NO2 in the Greater Toronto and Detroit-Windsor Areas (55)**
Darby Bates, Ramina Alwarda, Kimberly Strong, Xiaoyi Zhao, Vitali Fioletov, Sum Chi Lee, Debora Griffin and Yushan Su

12:10–12:30 **MAX-DOAS Surface and Tropospheric Column Validation: NO2 and HCHO in Toronto (29)**
Meike K. Rotermund, Victoria Flood, Martina M. Friedrich, Michel Van Roozendael, Xiaoyi Zhao and Kimberly Strong

12:30–14:00 **Lunch break**

14:00–14:20 **Cloud Classification and Satellite Comparison of CU MAX-DOAS Measurements During the 2024 Utah Summer Ozone Study. (32)**
Ruby Burgess, Robert Ryan, Clara Lietzke, Jan-Lukas Tirpitz, Nicolas Theys, Isabelle De Smedt, Gonzalo González, Abad, Caroline Nowlan, Heesung Chong and Rainer Volkamer

Session 2. Trace-gas vertical profiling

Chair: Thomas Wagner, Ankie Piters

14:20–14:40 **The Mainz profile algorithm (MAPA) version 2 (34)**
Steffen Beirle, Sebastian Donner, Steffen Ziegler and Thomas Wagner

14:40–15:00 **Simultaneous profiling of aerosol and tropospheric nitrogen dioxide from synergetic ground-based observations of sun-sky photometer and spectrometer (40)**
Masahiro Momoi, Elena Lind, Oleg Dubovik, Marcos Herreras-Giralda, Benjamin Torres, Tatyana Lapyonok, Anton Lopatin, Wushao Lin, Fernando Rejano, Marie Stöckhardt, Axel Kreuter and Alexander Cede

15:00–15:20 **Retrieval of NO2 and Aerosol Vertical Profiles During the CINDI-3 Campaign (49)**
Udo Frieß Andrè Achilli, Ramina Alwarda, Alkis Bais, Darby Bates, Tim Bösch, Elisa Castelli, Ka Lok Chan, Zeqing Chen, Mirjam den Hoed, Martina M Friedrich, Laura Gomez-Martin, Xiangguang Ji, Kevin Joshy, Dimitris Karagkiozidis, Hyeong-Ahn Kwon, Ang Li, Cheng Liu, Chaonan Lv, Paolo Pettinari, Ankie Piters, Andreas Richter, André Seyler, Kimberly Strong, Shiyao Tang, Michel Van Roozendael, Zijie Wang, Mark Wenig, Pinhua Xie, Chengzhi Xing, Jin Xu, Steffen Ziegler, Thomas Wagner and Steffen Beirle

15:20–15:50 **Coffee break**

15:50–16:10 **Glyoxal Vertical Profiles Using MAX-DOAS Observations over Thessaloniki, Greece: First results (57)**
Dimitris Karagkiozidis, Martina Michaela Friedrich, Michel Van Roozendael, Dimitris Nikolis and Alkis Bais

16:10–16:30 **Exploring SO2 Profiling Capabilities Using Pandora MAX-DOAS Measurements (63)**
Ramina Alwarda, Xiaoyi Zhao, Vitali Fioletov, Debora Griffin, Michel Grutter, Alberto Redondas, Martina Friedrich, Alexander Cede and Kimberly Strong

16:30–16:50 **Hybrid Active Open Path/MAX-DOAS Instrument: Combining Precise Surface Concentration Measurements with Vertical Profiling (39)**
Stefan Schmitt, Denis Pöhler, Martin Horbanksi and Johannes Lampel

16:50–18:00 **Poster Session**

Thursday, 10 July

08:45-09:00 **Registration**

Session 3. Instruments and algorithms

Chair: Alexander Cede, Alkis Bais

09:00-09:20 **Covariance-DOAS (CODOAS), the best of the two worlds? (46)**
Nicolas Theys, Isabelle De Smedt, Thomas Danckaert, Andreas Richter, Jonas Vlietinck and Michel Van Roozendael

09:20–09:40 **Sensitivity Study for the DOAS fit Settings of Formaldehyde Using Synthetic and Measured Spectra (23)**
Sebastian Donner, Steffen Beirle, Janis Pukite, Steffen Ziegler and Thomas Wagner

09:40–10:00 **Optimizing the Retrieval Algorithm for Ammonia Concentration Gradients from Multiple open-path DOAS Measurements (66)**
Jos de Boer and Shelley van der Graaf

10:00–10:20 **NO_2, O_3, OClO and BrO Stratospheric Photochemical Air Mass Factors at Marambio and Belgrano Antarctic stations (14)**
Laura Gomez-Martin, Cristina Prados-Roman, Martyn Chipperfield, Olga Puentedura, Monica Navarro-Comas, Michel Van Roozendael, Hector Ochoa, Miguel Montero-Vega and Margarita Yela

10:20–10:40 **Methane Imaging Based on Fabry–Perot Interference Correlation Spectroscopy (37)**
Yinsheng Lyu, Pinhua Xie, Jin Xu and Youtao Li

10:40–11:10 **Coffee break**

11:10–11:30 **Quantification of spectrograph straylight and detector sensitivity using high resolution sun spectra (13)**
Thomas Wagner, Carl-Fredrik Enell, Myojeong Gu, Bianca Lauster, Uwe Raffalski and Steffen Ziegler

11:30–11:50 **Assessment of Laboratory O4 (O2-O2 Collision-Induced) Absorption Cross-sections at 360 nm Using Atmospheric Long-path DOAS Observations (21)**
Bianca Lauster, Udo Frieß, Jan-Marcus Nasse, Ulrich Platt and Thomas Wagner

Session 4. Advances in satellite remote sensing and validation

Chair: Dimitris Balis, Jhoon Kim

11:50–12:10 **Improved air mass factors for TROPOMI tropospheric NO2 (36)**
Thomas Visarius, Andreas Richter, Heinrich Bovensmann and Hartmut Bösch

12:10–12:30 **Unleashing the potential of geostationary satellite observations in air quality forecasting through artificial intelligence techniques (19)**
Chengxin Zhang

12:30–14:00 **Lunch break**

14:00–14:20 **Synergistic Satellite Hyperspectral Remote Sensing with Artificial Intelligence and UAV-Based Hyperspectral Imaging for Atmospheric Pollution Monitoring (28)**
Cheng Liu, Qihou Hu, Chengzhi Xing, Chengxin Zhang, Qihua Li, Haoran Liu, Wei Tan and Xiangguang Ji

14:20–14:40 **Harmonized tropospheric NO2 retrieval from LEO and GEO constellations and its application to air quality monitoring (51)**
Sora Seo, Diego Loyola, Ronny Lutz, Klaus-Peter Heue, Pascal Hedelt, Víctor Molina García and Jhoon Kim

14:40–15:00 **Enhancing the quality of TEMPO NO2 Slant Column Densities by destriping (3)**
Symeon Vlassis, Andreas Richter, Kezia Lange and Kai Krause

15:00–15:20 **Pushing the Limits – What can we Learn from Averaged TROPOMI Spectra? (54)**
Andreas Richter, Thomas Wagner, Steffen Beirle, Holger Sihler and Hartmut Bösch

15:20–15:50 **Coffee break**

15:50–16:10 **Optimized OClO Retrieval Algorithm for TROPOMI: Evaluation and Validation in Preparation of the Operational AC-SAF Sentinel-5 OClO Product (53)**
Leonardo M. A. Alvarado Bonilla, Seo Sora and Diego Loyola

16:10–16:30 **MAX-DOAS Measurement Sites in Italy: Overview, NO2 VCD Comparison Against TROPOMI and Profiles Retrieval (17)**
Andrè Achilli, Elisa Castelli, Enzo Papandrea, Paolo Pettinari, Massimo Valeri, Francesco Cairo, Luca Di Liberto, Francescopiero Calzolari, Claudio Campenni and Spartaco Ciampichetti

Session 5. Remote sensing of emissions

Chair: Andreas Richter, Kimberly Strong

16:30–16:50 **Airborne Mapping of Tropospheric NO2 Distributions During the CINDI-3 Campaign (1)**
Frederik Tack, Alexis Merlaud, Ward Van Roy, Annelore Van Nieuwenhove, Dirk Schuettemeyer and Michel Van Roozendael

16:50–17:10 **Imaging of Shipping NO2-Plumes at a Major Shipping Lane Using Imaging DOAS Measurements (62)**
Helge Haveresch, Anja Schönhardt, Andreas Richter, Folkard Wittrock, Mihalis Vrekoussis, and Hartmut Bösch

17:10–18:00 **Poster Session**

19:30 **Optional Joint Dinner at own cost**

Friday, 11 July

09:00-09:20 **Investigating Shipping Emissions at Halifax Harbour, Canada (65)**
Kevin Joshy, Meike K. Rotermund, Aldona Wiacek, Xiaoyi Zhao and Kimberly Strong

09:20–09:40 **Monitoring of Shipping Emissions from a Wind Farm Platform in the North Sea: First Results of the SEMPAS Project (9)**
Gytha Mettepenningen, Caroline Fayt, Cato Van Doorne, Frederik Tack, Lars Jacobs, Aurélien Aubry, Sophie Berkenbosch, Filip Desmet, Martine De Mazière and Michel Van Roozendael

09:40–10:00 **ICAD measurements for Real-World NOx Emission Detection of Vehicles and Ships (47)**
Denis Pöhler, Christina Schmidt, Yoann Bernard, Thomas Frateur, Norbert Ligterink, Michal Vojtisek, Philipp Eger and Ulrich Platt

10:00–10:20 **Measuring Gas Emissions from the World's Most Active Volcanoes (41)**
Christoph Kern

10:20–10:40 **Quantifying NOx emissions by mass balance using airborne DOAS, Doppler lidar, and in-situ data synergies in the Colorado Front Range (15)**
Clara Lietzke, Sunil Baidar, Robert Ryan, Ruby Burgess, Jan-Lukas Tirpitz, Alan Brewer, Steven Brown, Xinrong Ren and Rainer Volkamer

10:40–11:10 **Coffee break**

Session 6. Data exploitation and applications

Chair: Cristina Prados Roman, Christoph Kern

11:10–11:30 **The Bremen tram DOAS Instrument – Observations of Spatial and Temporal NO2 Variability (60)**
Kezia Lange, Andreas Richter, Tim Suhling, Lisa Behrens, John P. Burrows and Hartmut Bösch

11:30–11:50 **Revisiting the Glyoxal-to-Formaldehyde Ratio (RGF) as a Proxy for VOC Source Identification (33)**
Simon Bittner, Andreas Richter, Bianca Zilker, Sebastian Donner, Thomas Wagner and Mihalis Vrekoussis

11:50–12:10 **Optical Closure Studies of Aerosol Extinction (69)**
Rainer Volkamer, Sunil Baidar, Ruby Burgess, Clara Lietzke, Mago Reza, Jan-Lukas Tirpitz and Robert Ryan

12:10–12:30 **Tropospheric BrO and Sea Ice State of Development in the Weddell Sea Region (Antarctica) (8)**
Cristina Prados-Roman, Laura Gomez-Martín, Jose Antonio Adame, Olga Puentedura, Mónica Navarro-Comas, Héctor Ochoa and Margarita Yela

12:30–14:00 **Lunch break**

14:00–14:20 **Simultaneous observations of atmospheric IO radical, O3, and sea surface iodide over the tropical western Pacific warm pool: strong correlation of IO levels with estimated inorganic iodine fluxes (5)**
Hisahiro Takashima, Yugo Kanaya, Yoko Iwamoto, Kazuhiko Takeda, Takashi Sekiya, Fumikazu Taketani, Martina M. Friedrich, Michel Van Roozendael, Atsushi Ooki, Takuma Miyakawa, Shin-Ya Ogino and Masaki Katsumata

14:20–14:40 **Application and analysis of MAX-DOAS cloud filtering in Salt Lake City, US and Melbourne, Australia. (20)**
Robert Ryan, Ruby Burgess, Jan-Lukas Tirpitz, Robyn Schofield and Rainer Volkamer

14:40–15:00 **Spatiotemporal distribution and formation mechanisms of HONO in agricultural areas based on long-term 2D-MAXDOAS observations (27)**
Weiwei Hu, Ang Li and Zhaokun Hu

15:00–15:20 **Exploring HONO Production in Biomass Burning Aerosols with the ICAD (Iterative Cavity-Enhanced DOAS) (7)**
Fengxia Bao and Markus Ammann

15:20–16:00 **Closing of DOAS workshop 2025**

List of Posters

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Elisa Castelli, Luca Facheris, Fabrizio Cuccoli andrè Achilli, Enzo Papandrea, Ugo Cortesi, Samuele Del Bianco, Francesco Montomoli, Massimo Baldi, Flavio Barbara andrea Donati, Samantha Melani, Luca Rovai andrea Antonini, Maurizio Busetto, Francescopiero Calzolari, F. Argenti, M. Viti, Alberto Ortolani, A. Filipeschi, I. Marsili and S. Marcuccio

4 **Retrieval of Vertical Profiles of Formaldehyde and Glyoxal From MAX-DOAS Data Measured During the CINDI-3 Campaign in Cabauw, The Netherlands, 2024**
Tim Bösch, Simon Bittner, John Burrows, Helge Haveresch, Kai Krause, Kezia Lange, Attahir Mainika andreas Richter, Anja Schönhardt andré Seyler and Hartmut Bösch

6 **Direct sun total NO2 column measurements at Thessaloniki, Greece with two DOAS systems and comparisons with S5P/TROPOMI**
Dimitrios Nikolis, Alkiviadis Bais, Dimitris Karagkiozidis, Maria-Elissavet Koukouli and Dimitris Balis

10 **Hyperspectral stereoscopic remote sensing network reveals the regional transport of aerosol and its precursors**
Chengzhi Xing and Wei Tan

11 **Investigation of novel satellite observations for fire monitoring**
Katerina Anyfanti and Mariliza Koukouli

12 **Mobile MAX-DOAS measurements and source analysis of NO2, HCHO and HONO during the Chengdu 2023 FISU World University Games**
Wei Tan and Chengzhi Xing

16 **Mobile MAX-DOAS Observations of Tropospheric NO2 and HCHO During Summer over the Three Rivers' Source Region in China**
Siyang Cheng, Xinghong Cheng, Jianzhong Ma, Xiangde Xu, Steffen Ziegler, Sebastian Donner and Thomas Wagner

18 **USTC-PRM: a Parameterized Approach for Profile Retrieval of Aerosol and Trace Gases**
Qihua Li, Zhiguo Zhang, Chuan Lu, Qihou Hu and Cheng Liu

22 **Long-path DOAS Observations of Halogen Oxides at Utqiagvik, Alaska**
Bianca Lauster, Sebastian Donner, Udo Frieß, Ulrich Platt, Lucas Reischmann, William Simpson, Steffen Ziegler and Thomas Wagner

24 **Investigating Small-Scale Vertical Concentration Gradients of Formaldehyde and Glyoxal Above the Canopy at the Amazon Tall Tower Observatory (ATTO) Using two MAX-DOAS Instruments**
Sebastian Donner, Bianca Lauster, Steffen Ziegler, Paulo Artaxo, Steffen Beirle, Achim Edtbauer, Akima Ringsdorf, Jonathan Williams and Thomas Wagner

25 **Development and Application of a Homemade BBCEAS-Automated Dynamic Chamber System for Measuring HONO Fluxes in Agricultural Field**
Min Qin, Baobin Han, Wu Fang, Jianye Xie, Enbo Ren and Pinhua Xie

26 **Variations in Vertical Distributions of O3, its Precursors and Formation Sensitivity in China: Implications for O3 Pollution Prevention Strategies**
Xiangguang Ji, Qihou Hu, Chengzhi Xing, Haoran Liu, Qihua Li, Wei Tan and Cheng Liu

30 **Relating satellite NO2 tropospheric columns to near-surface concentrations: implications from ground-based MAX-DOAS NO2 vertical profile observations**
Haoran Liu, Bowen Chang, Chengxin Zhang, Chengzhi Xing, Wei Tan, Qihua Li, Xiangguang Ji, Qihou Hu and Cheng Liu

31 **Study of NO2 and HCHO vertical profile measurement based on Fast Synchronous MAX-DOAS**
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35 **Determining Spectrometer Non-Linearity using Dark Current Measurements - An Update**
Steffen Ziegler, Steffen Beirle, Sebastian Donner, Bianca Lauster, Lucas Reischmann, Hanna Rohringer and Thomas Wagner

38 **Satellite-Based Monitoring of HONO over Asian Wildfire Events Using Geostationary Environment Monitoring Spectrometer (GEMS)**
Hyeji Cha, Jhoon Kim, Heesung Chong, Gonzalo González Abad, Dhahyun Ahn, Nicolas Theys, Sang Seo Park and Won-jin Lee

42 **Continuous Scanning DOAS Measurements of Gas Emissions from Mount Cleveland, Alaska, Provide Insights into Volcanic Processes**
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