GGOS Topical Meeting on the Atmosphere

Wissenschaftsetage im Bildungsforum
Potsdam, Germany | October 7 – 9, 2024
www.ggos.org/event/ggos-topical-meeting-atmosphere/

Programme

Monday, 7 October 2024

11:30 - 13:00	Registration

Opening

13:00 - 13:15	Welcome *Laura Sánchez, Robert Heinkelmann*
13:20 - 13:35	GNSS Remote Sensing: Innovative Earth Observation with big prospects *Jens Wickert*
13:40 - 13:55	Possible definition of Essential Variables for the Upper Atmosphere from the perspective of the Focus Area "Geodetic Space Weather Research" *Michael Schmidt, Ehsan Forootan*

Magnetosphere, Ionosphere, Plasmasphere and Thermosphere, as a coupled system
Convener: Michael Schmidt

14:00 - 14:15	DFG Research Unit Magnetosphere, Ionosphere, Plasmasphere and Thermosphere, as a coupled system (MIPT) *Yuri Shprits, Juergen Kusche, Michael Schmidt, Claudia Borries, Tatjana Gerzen, Elena Kronberg, Artem Smirnov, Dedong Wang*
14:20 - 14:35	Advanced thermosphere modelling to increase consistency between observational datasets and enable new applications *Günther March, Armin Corbin*
14:40 - 14:55	Regular pattern in the solar wind impact on the ionosphere *Claudia Borries, Pelin Iochem*

15:00 - 15:05	**Group photo**

15:05 - 16:30	**Coffee break + Poster session**

16:30 - 16:45	Enhancing Mass Density Estimation of physical models in the thermosphere using data assimilation *Armin Corbin, Jürgen Kusche*
16:50 - 17:05	[withdrawn] Assimilation of satellite geodetic data into the models of upper atmosphere *Ehsan Forootan, Saeed Farzaneh, Michael Schmidt, Maike Schumacher*
17:10 - 17:25	Estimation of the topside ionosphere and plasmasphere by an Ensemble Kalman Filter (EnKF) and the simultaneous multiplicative column-normalized method SMART+ *Tatjana Gerzen, Michael Schmidt, David Minkwitz*

18:30	**Dinner** (at restaurant L'Osteria | Registration required)

Tuesday, 8 October 2024

Ionosphere modelling and applications
Convener: Paweł Wielgosz

08:30 - 08:45	A review on global ionospheric models and potential refinements *Ningbo Wang, Zishen Li, Ang Liu, Ang Li, Zhouyu Zhang*
08:50 - 09:05	Study on hybrid LEO constellations for ionosphere reconstruction *Lucas Schreiter, Andreas Brack, Benjamin Männel, Harald Schuh, Daniel Arnold, Adrian Jäggi*
09:10 - 09:25	Ionospheric Radio Occultation as a tool for model validation *Joana Pires Morgado Fernandes Pereira*
09:30 - 09:45	Advances on 3D Ionospheric Imaging at Low-Latitudes *Fabricio dos Santos Prol*
09:50 - 10:05	ROTI Mapping Towards Monitoring Ionospheric Irregularities and Impact on GNSS Precise Positioning *Ningbo Wang, Zhe Yang*
10:10 - 10:25	Multi-GNSS Ionospheric SSR Corrections for Enhanced GNSS Positioning Performances in South America *Paulo S. de Oliveira Jr., Fabricio Prol, Lucas Bezerra*

10:30 - 11:00	**Coffee break + Poster session**

Climate application of geodetic atmospheric parameters
Convener: Rosa Pacione

11:00 - 11:15	Climate Applications of Geodetic Tropospheric Parameters *Rosa Pacione*
11:20 - 11:35	GNSS tropospheric modeling and its applications *Cuixian Lu, Yuxin Zheng, Jiafeng Li, Xuanzhen Zhang, Chengbo Liu*
11:40 - 11:55	GNSS Reflectometry: A Paradigm Shift in Atmospheric Monitoring and Research *Milad Asgarimehr, Tianqi Xiao, Daixin Zhao, Jens Wickert*
12:00 - 12:15	GNSS-based Precipitable Water Vapor for the Global Climate Observing System

Galina Dick, Florian Zus, Jens Wickert, Benjamin Männel, Markus Ramatschi, Markus Bradke

12:20 - 12:35	Aliasing of atmospheric cloud water in time-variable gravity models from GRACE/-FO and NGGM? Why cloud modeling might become more important for satellite gravimetry *Christian Mielke, Anne Springer, Jürgen Kusche*
12:40 - 14:00	**Lunch break**

Geohazards monitoring
Convener: Michela Ravanelli

14:00 - 14:15	An insight on Co-Seismic Ionospheric Disturbances: from first observations to new challenges *Michela Ravanelli*
14:20 - 14:35	Fingerprints of seismic activity in ionospheric electron density variations *Paweł Wielgosz, Wojciech Jarmołowski, Anna Krypiak-Gregorczyk, Beata Milanowska*
14:40 - 14:55	Leveraging GNSS ionospheric Total Electron Content (TEC) data as a complementary tool for Tsunami Early Warning Systems *Federica Fuso, Michela Ravanelli*
15:00 - 16:30	**Coffee break + Poster session**
16:30 - 16:45	GFZ Global Ionospheric Disturbances Monitoring System and Initial Results on the Effects of Scintillations on GNSS Signal Quality at Different Frequencies *Chinh Nguyen, Markus Ramatschi, Jens Wickert, Christina Arras, Benjamin Männel, Markus Bradke, Torsten Schmidt*
16:50 - 17:05	GNSS remote sensing to study sea-ice and ionospheric irregularities in the central Arctic *Maximilian Semmling, Martin Kriegel, Jens Wickert, Sebastian Gerland, Gunnar Spreen, Mainul Hoque, Jens Berdermann*
17:10 - 17:25	Towards Near-real-time Ionospheric Monitoring of Tsunamis using the GUARDIAN System *Siddharth Krishnamoorthy, Léo Martire, Attila Komjathy, Bela Szilagyi, Panagiotis Vergados, Larry Romans, Yoaz Bar-Sever, Allison Craddock, Fiona Luhrmann, Jihye Park, Pavel Inchin, Christopher Moore, Ernesto Fernandez, Vasily Titov*

Wednesday, 9 October 2024

Geodetic Methods for Water Vapor Monitoring
Convener: Kyriakos Balidakis

08:30 - 08:45	Geodetic Methods for Water Vapor Monitoring *Kyriakos Balidakis, Florian Zus, Jungang Wang, Rohith Muraleedharan Thundathil*
08:50 - 09:05	Prediction and Monitoring of Precipitable Water Vapor (PWV) Profiles Using GNSS-Radio Occultation (GNSS-RO) Satellite Technique in Turkey *Emine Tanır Kayıkçı, Seldanur Çelik Tunçer, Ahmet Yavuzdoğan, Murat Bektaşoğlu, Şeyma Gül Cihan, Kutluhan Gümrükçüoğlu, Mualla Yalçınkaya, Kamil Teke, Yasemin Şişman, Neslihan Beden, Jens Wickert*
09:10 - 09:25	On the Agreement of 12 Years PWV from WVR, GNSS, Radiosonde, and ERA5

Jungang Wang, Kyriakos Balidakis, Mathias Palm, Torsten Schmidt, Jens Wickert, Robert Heinkelmann, Harald Schuh

09:30 - 09:45   Validation of the new multi-channel water vapour radiometer for atmospheric corrections in space geodesy
Peng Feng, Gunnar Elgered, Rüdiger Haas

Severe weather monitoring with geodetic techniques
Convener: Kyriakos Balidakis

09:50 - 10:05   Assimilation of ground-based GNSS Zenith Total Delays and tropospheric gradients for Severe Weather Prediction
Rohith Thundathil, Florian Zus, Galina Dick, Jens Wickert

10:10 -10:25   Atmospheric Delay Parameterization in Storm-Resolving Numerical Weather Models
Kyriakos Balidakis, Leonid Petrov, Florian Zus, Jungang Wang, Rohith Thundathil, Henryk Dobslaw

10:30 - 11:00   **Coffee break + Poster session**

11:00 - 11:15   Severe weather analysis with real-time GNSS tropospheric products and radar reflectivity
Viktoria Pencheva, Tsvetelina Dimitrova, Guergana Guerova

11:20 - 11:35   Tracking of severe thunderstorms using GNSS-SNR: Case studies from summer 2023 over Central Europe
Matthias Aichinger-Rosenberger, Benedikt Soja

11:40 - 11:55   GRENet: GNSS-enhanced Radar Extrapolation Network for Precipitation Nowcasting
Quanfei Wang, Cuixian Lu, Yuxin Zheng, Galina Dick, Jonathan Jones

Atmospheric modelling based on artificial intelligence
Convener: Benedikt Soja

12:00 - 12:15   Machine learning enabled extreme rainfall prediction using GNSS, Radar, lightning, and weather data for Indian coastal city
Sumit Pandey, Ramji Dwivedi

12:20 - 12:35   Machine Learning-Based Ionospheric Corrections for Single-Frequency VLBI Observations
Benedikt Soja, Marcel Iten, Arno Rüegg, Matthias Schartner, Hana Krásná, Marisa Nickola, Aletha De Witt

12:40 - 14:00   **Lunch break**

14:00 - 14:15   Combination of Optimization Machine Learning and Statistical Tests to Determine MIT Key Parameters for Ionospheric Forecast Models
Nhung Le, Benjamin Männel, Andreas Brack, Chinh Nguyen, Thach Thanh Luong, Tham Bui Thi Hong, Jens Wickert, Harald Schuh

14:20 - 14:35   Simulation-based analysis of near real-time tropospheric delay estimation using the variometric algorithm
Rachele Fratini, Alessandra Maria De Pace, Marco Fortunato, Augusto Mazzoni, Mattia Crespi

14:40 - 15:15   **Closing / Summing up**

Poster Presentations

Authors are invited to hang their posters during the registration period (11:30 - 13:00) on Monday 7 October. The posters will be on display during the three days of the conference.

Ionosphere modelling and applications
Convener: Paweł Wielgosz

Comparison and quality assessment of differential total electron content obtained from VGOS and CODE GIM.
Nataliya Zubko, Niko Kareinen, Munghui Xu, Tuomas Savolainen, Markku Poutanen

A Geophysically Informed Random Forest for Predicting VTEC in Northern Malawi
Robert Galatiya Suya

Ionospheric irregularities detected from GNSS measurements collected at COSMIC-2 Precise Orbit Determination antennas [withdrawn]
Ayomide Olabode, Lucas Schreiter, Christina Arras, Andreas Brack, Mahdi Alizadeh, Lung-Chih Tsai, Harald Schuh

Effectiveness of CCD ionospheric monitors for air navigation based on GBAS: Investigation and implementation under Brazilian conditions
Renan Rodrigues Toledo Costa, Paulo Sergio de Oliveira Júnior, Ivandro Klein, Thiago Tiedtke dos Reis, Weverton da Costa Silva, João F. Galera Monico

K-band (24 GHz) VLBI signal path delays caused by the troposphere and ionosphere
Hana Krasna, Aletha de Witt, Christopher S. Jacobs, David Gordon, Benedikt Soja

An open-source ray-tracing tool for space geodetic techniques
Florian Zus, Kyriakos Balidakis, Ali Hasan Dogan, Rohith Thundathil, Galina Dick, Jens Wickert

Performance Analysis of Dual-Frequency Precise Point Positioning under the Effects of Extreme Geomagnetic Storm: A Case Study of "May 2024 Solar Storm (10-13 May 2024)"
Paulo Sergio de Oliveira Junior, Lucas dos Santos Bezerra, Claudia Pereira Krueger

Impact of different broadcast ionospheric Models on single-frequency GPS positioning
Lahouaria Tabti [withdrawn]

Climate application of geodetic atmospheric parameters
Convener: Rosa Pacione

GNSS radio occultation data for weather forecast and climate research
Torsten Schmidt, Patrick Schreiner, Jens Wickert

Improvement of snow depth estimation using GNSS reflected signals
Xintai Yuan

Assessment of ERA5 Diurnal Cycle Mismatches in Tropospheric Zenith Total Delays Using GNSS Data
Peng Yuan, Harald Schuh, Jens Wickert, Zhiguo Deng

15 years GNSS Meteorology in Bulgaria/Southeast Europe
Guergana Guerova

Quantitative Analysis of Multi-source Slant Tropospheric Delays at Chinese VLBI Stations
Jun Jiang, Shuli Song

Further Analysis on Long-Term Ground-Based GNSS-Derived ZTD Trends Estimated from REPRO3 Solutions
Kyriakos Balidakis, Marcelo Santos, Anna Klos, Rosa Pacione, Riley Hughes

Atmospheric water vapour retrieval with mass-market GNSS receivers

B. Ambrus, A. Khaldi, Sz. Rozsa

Impact of synergistic assimilation of Radar-based precipitation and GNSS zenith total delay on heavy rainfall forecast: A case study over northern Germany in 2017
Jiafeng Li, Cuixian Lu, Yuxin Zheng

MSDM: A Generative Adversarial Network for precipitation nowcasting over West American using multi-source data
Xindi Luo, Cuixian Lv, Yuxin Zheng, Quanfei Wang

Real-time high-resolution tropospheric delay mapping based on GFS forecasts and GNSS
Xuanzhen Zhang, Cuixian Lu, Yuxin Zheng, Chengbo Liu, Bo He

Atmospheric modelling based on artificial intelligence
Convener: Benedikt Soja

Adaptation of AI Weather Models for Extreme Precipitation Forecasting Using GNSS-Derived Precipitable Water Vapor
Liangjing Zhang

Explainable AI for GNSS Reflectometry: Investigating Feature Importance for Ocean Wind Speed Estimation
Tianqi Xiao, Milad Asgarimehr, Daixin Zhao, Jens Wickert

Prediction of atmospheric parameters at the Geodetic Prediction Center of ETH Zurich
Benedikt Soja, Laura Crocetti, Marcel Iten, Shuyin Mao, Matthias Schartner

Machine Learning-Based Tropospheric Delay Model for High-Resolution Regional Integrated Water Vapor Retrievals
Lingke Wang, Duo Wang, Hansjoerg Kutterer

Paper publication

Participants are invited to submit their papers to

Journal: Advances in Space Research (ASR),
https://cosparhq.cnes.fr/publications/advances-in-space-research-asr/
Special Issue: Ionospheric Imaging: Recent Advances and Future Directions
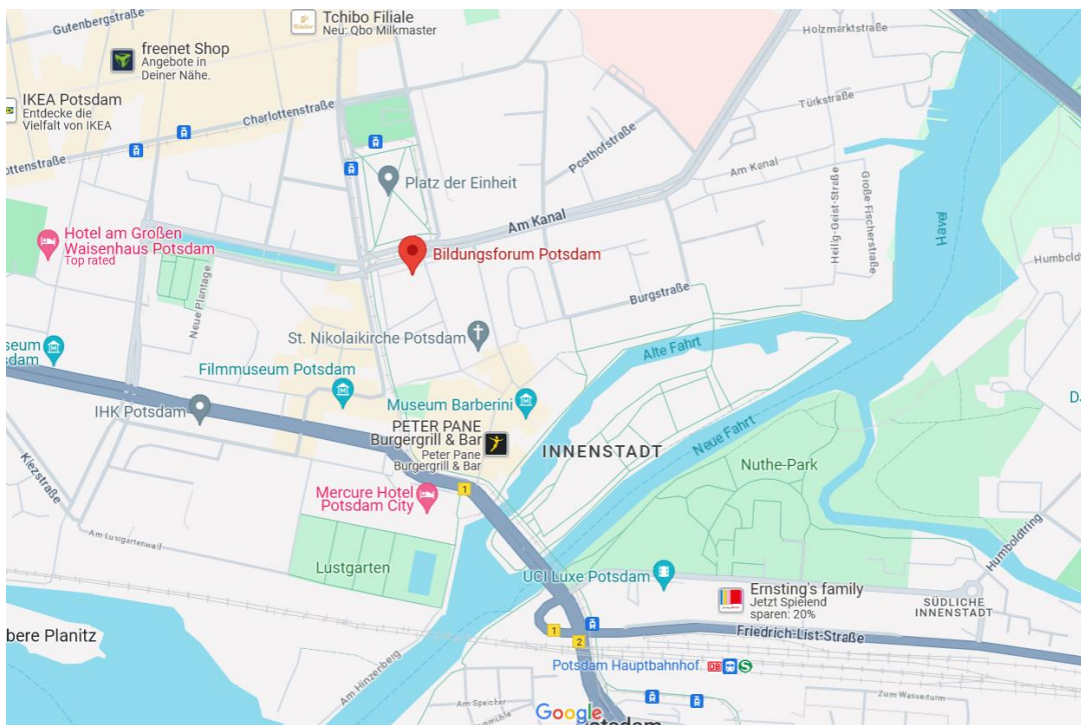**Deadline: 15 January 2025**
Guest Editors: Marcio Muella, Fabricio Prol
More details at: https://cosparhq.cnes.fr/assets/uploads/2024/04/Ionospheric-Imaging.pdf

Submissions will be subject to peer review before publication.

Venue

The GGOS Topical Meeting on the Atmosphere will be hosted in the *Wissenschaftsetage im Bildungsforum* (https://www.wis-potsdam.de/de/wis-wissenschaftsetage-im-bildungsforum) located in (https://www.wis-potsdam.de/en/contact-find-us-0):

proWissen Potsdam e. V.
WIS im Bildungsforum
Am Kanal 47
14467 Potsdam
Germany

Courtesy of Google maps