

PUBLICATIONS AND PATENTS

JIA CHEN

Underline denotes advisee; Star * denotes that I am a corresponding author.

h-index: 26, i10-index: 64 (Google Scholar, 08/2023)

MOST IMPORTANT PUBLICATIONS (LAST 5 YEARS)

1. **J. Chen***, C. Viatte, J. K. Hedelius, T. Jones, J. E. Franklin, H. Parker, E. W. Gottlieb, P. O. Wennberg, M. K. Dubey, S. C. Wofsy, “[Differential column measurements using compact solar-tracking spectrometers](#)”, Atmospheric Chemistry and Physics, 16, 8479–8498, doi: 10.5194/acp-16-8479-2016, 2016.
Description: Novel measurement concept that creates a foundation for monitoring urban greenhouse gases.
2. **J. Chen***, F. Dietrich, H. Maazallahi, A. Forstmaier, D. Winkler, M. E. G. Hofmann, H. Denier van der Gon, T. Röckmann: “[Methane emissions from the Munich Oktoberfest](#)”, Atmospheric Chemistry and Physics, 20, 3683–3696, highlight article, doi: 10.5194/acp-20-3683-2020, 2020.
Research highlight in **Nature** (Nature, 580(7802), 169, doi: 10.1038/d41586-020-00987-5) and featured in **Science** (doi: 10.1126/science.aaz9918)
Description: Worldwide first study that quantifies the methane emission of a large festival. It provides a basis for developing reduction policies for such events and new pathways to mitigate fossil fuel methane emissions.
3. F. Dietrich, **J. Chen***, B. Voggenreiter, P. Aigner, N. Nachtigall, B. Reger, “[MUCCnet: Munich Urban Carbon Column network](#)”, Atmospheric Measurement Techniques, 14, 1111–1126, doi: 10.5194/amt-14-1111-2021, 2021.
Featured in **Physics Today** (doi: 10.1063/PT.6.1.20210311a)
Description: World’s first urban sensor network that has been permanently measuring greenhouse gases based on the principle of differential column measurements; Website and open-data platform: [atmosphere.ei.tum.de](#).
4. A. Shekhar, **J. Chen***, J. C. Paetzold, F. Dietrich, X. Zhao, S. Bhattacharjee, V. Ruisinger, S. C. Wofsy, “[Anthropogenic CO₂ emissions assessment of Nile Delta using XCO₂ and SIF data from OCO-2 satellite](#)”, Environmental Research Letters, 15, 095010, doi: 10.1088/1748-9326/ab9cfe, 2020.
Description: Using novel satellite data, we reveal that CO₂ emissions from the Nile Delta account for 1% of global anthropogenic emissions, which is significantly more than estimated hitherto.
5. F. Toja-Silva, **J. Chen**, S. Hachinger, F. Hase, “[CFD simulation of CO₂ dispersion from urban thermal power plant: Analysis of turbulent Schmidt number and comparison with Gaussian plume model and measurements](#)”, Journal of Wind Engineering and Industrial Aerodynamics, 169, 177–193, doi: 10.1016/j.jweia.2017.07.015, 2017.
Description: Emission assessment using CFD simulation of CO₂ dispersion from an urban power plant: mapping column concentrations with unprecedented high spatial resolution.
6. Zanger, B., **Chen, J.***, Sun, M., and Dietrich, F.: [Recovery of sparse urban greenhouse gas emissions](#), Geoscientific Model Development, 15, 7533–7556, doi: <https://doi.org/10.5194/gmd-15-7533-2022>, 2022.
7. Gensheimer, J., Turner, A. J., Köhler, P., Frankenberg, C., and **Chen, J.***: “[A convolutional neural network for spatial downscaling of satellite-based solar-induced chlorophyll fluorescence \(SIFnet\)](#)”, Biogeosciences, 19, 1777–1793, doi: 10.5194/bg-19-1777-2022, 2022.
8. M. Reißmann, **J. Chen***, G. Osterman, F. Dietrich, M. Makowski, X. Zhao, F. Hase, M. Kiel, [Validation of OCO-2 target observations using MUCCnet - Is it possible to capture urban XCO₂ gradients from space?](#), Atmospheric Measurement Techniques, 15, 6605–6623, doi: 10.5194/amt-15-6605-2022, 2022
9. V. Balamurugan, **J. Chen***, X. Bi, Z. Qu, J. Gensheimer, A. Shekhar, S. Bhattacharjee, F. Keutsch, “[Tropospheric NO₂ and O₃ response to COVID-19 lockdown restrictions at the national and urban scales in Germany](#)”, Journal of Geophysical Research: Atmospheres, 126, e2021JD035440, doi: 10.1029/2021JD035440, 2021

10. [S. Bhattacharjee](#) and [J. Chen*](#), “Prediction of satellite-based column CO₂ concentration by combining emission inventory and LULC information”, IEEE Transactions on Geoscience and Remote Sensing, 58, 8285–8300, doi: 10.1109/TGRS.2020.2985047, 2020.

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- 2016 [Jia Chen](#), Jenna Samra, Steven Wofsy, John Budney. [Diffuser-Based Solar-Tracking with Camera for Atmospheric Measurements](#) (WO2016187502A1)
- 2016 [Jia Chen](#), Ludwig Heinle, Andreas Meichelböck, Gerold Wunsch. [Automatisches, kompaktes Wetterschutzgehäuse für atmosphärische Messgeräte](#) (DE102016005465A1)
- 2012 [Jia Chen](#), Maximilian Fleischer, Andreas Hangauer, Rainer Strzoda. [Measuring Arrangement for Optical Absorption Spectroscopy in Hot Environments](#) (WO2012069510A1, EP2619531B1)
- 2011 [Jia Chen](#), Andreas Hangauer, Rainer Strzoda. [Arrangement for Measuring the Concentration of Oxygen in the Exhaust Gas Region of a Furnace](#) (WO2011092274A1)
- 2011 [Jia Chen](#), Andreas Hangauer, Rainer Strzoda. [Measuring Method and Measuring Device for Optical Gas Measurement](#) (WO2011026924A1, EP2473836A1, US2013162979A1, CN102483377A)
- 2010 [Jia Chen](#), Andreas Hangauer, Rainer Strzoda. [Non-Linear Wavelength Modulation in Laser Spectroscopy](#) (WO2010106064A1)
- 2009 [Jia Chen](#), Andreas Hangauer, Rainer Strzoda. [Anordnung zur Durchführung spektroskopischer Verfahren sowie Verwendung bei spektroskopischen Verfahren](#) (WO2010092108A1, DE102009008624B4)
- 2009 [Jia Chen](#), Andreas Hangauer, Hans Link, Rainer Strzoda. [Method and Device for Controlling or Monitoring Firing Systems and for Monitoring Building Having Gas Burners](#) (WO2010003890A3, EP2304320A2, DE102009009314A1, CN102077028A)
- 2008 [Jia Chen](#), Andreas Hangauer, Rainer Strzoda. [Method for Detection of Gases by Laser Spectroscopy](#) (WO2010003857A1, EP2307876B1, US8830469B2, CN102105779B)
- 2007 [Jia Chen](#), Andreas Hangauer, Rainer Strzoda. [Laser Light Source with at Least Two Individual Lasers](#) (WO2009024504A1, DE102007038943A1)
- 2006 [Jia Chen](#), Oliver Hennig, Rainer Strzoda. [Gas analysis with laser spectroscopy](#) (EP1873513B1)
- 2005 [Jia Chen](#), Klaus Dostert, Thorsten Huck, Juergen Schirmer. [Verfahren und Vorrichtung zum Generieren stochastischer Zufallsvariablen](#) (DE102005063273B4)

BOOKS, BOOK CHAPTERS AND GUIDELINES

1. [Shrutilipi Bhattacharjee](#), [Johannes Madl](#), [Jia Chen](#), [Varad Kshirsagar](#), [Spatiotemporal Analysis](#). In: Encyclopedia of Mathematical Geosciences. Encyclopedia of Earth Sciences Series. Springer, Cham. doi: 10.1007/978-3-030-26050-7_305-1, ISBN: 978-3-030-26050-7, 2022
2. [Shrutilipi Bhattacharjee](#), [Johannes Madl](#), [Jia Chen](#), [Varad Kshirsagar](#), [Spatiotemporal Modeling](#). In: Encyclopedia of Mathematical Geosciences. Encyclopedia of Earth Sciences Series. Springer, Cham. doi: 10.1007/978-3-030-26050-7_418-1, ISBN: 978-3-030-26050-7, 2022
3. [Shrutilipi Bhattacharjee](#), Soumya K. Ghosh, [Jia Chen](#), [Semantic Kriging for Spatio-temporal Prediction](#), Studies in Computational Intelligence book series, Springer Nature, doi: 10.1007/978-981-13-8664-0, ISBN: 978-981-13-8663-3, 2019
4. [Jia Chen](#), [Compact Laser-Spectroscopic Gas Sensors using Vertical-Cavity Surface-Emitting Lasers](#), Dissertation, Selected topics of semiconductor physics and technology, Walter Schottky Institut, 150 pages, ISBN: 978-3-941650-30-5, 2011

5. Jocelyn C. Turnbull, Phil DeCola, Kim Mueller, Felix Vogel, **Jia Chen** et al. [IG3IS Urban Greenhouse Gas Emission Observation and Monitoring Best Research Practices](#), World Meteorological Organization (WMO) GAW IG3IS Report 2021

JOURNAL PUBLICATIONS (IN REVIEW)

1. [Sebastian Lober](#), [Florian Dietrich](#), **Jia Chen***, "[Computational Fluid Dynamics Model to Simulate Methane Dispersion at Oktoberfest](#)", *Journal of Geophysical Research: Atmospheres*, doi: 10.1002/essoar.10506185.1, 2021.

PEER REVIEWED JOURNAL PUBLICATIONS

1. [Zhao, X.](#), **Chen, J.***, [Marschall, J.](#), [Gałkowski, M.](#), [Hachinger, S.](#), [Dietrich, F.](#), [Shekhar, A.](#), [Gensheimer, L.](#), [Wenzel, A.](#), and [Gerbig, C.](#): [Understanding greenhouse gas \(GHG\) column concentrations in Munich using the Weather Research and Forecasting \(WRF\) model](#): *Atmos. Chem. Phys.*, 23, 14325–14347, <https://doi.org/10.5194/acp-23-14325-2023>, 2023.
2. [Balamurugan, V.](#), **Chen, J.***, [Wenzel, A.](#), and [Keutsch, F. N.](#): [Spatiotemporal modeling of air pollutant concentrations in Germany using machine learning](#), *Atmos. Chem. Phys.*, 23, 10267–10285, doi: 10.5194/acp-23-10267-2023, 2023.
3. [Forstmaier, A.](#), **Chen, J.***, [Dietrich, F.](#), [Bettinelli, I.](#), [Maazallahi, H.](#), [Schneider, C.](#), [Winkler, D.](#), [Zhao, X.](#), [Jones, T.](#), [van der Veen, C.](#), [Wildmann, N.](#), [Makowski, M.](#), [Uzun, A.](#), [Klappenbach, F.](#), [Denier van der Gon, H.](#), [Schwietzke, S.](#), and [Röckmann, T.](#): [Quantification of methane emissions in Hamburg using a network of FTIR spectrometers and an inverse modeling approach](#), *Atmos. Chem. Phys.*, in press, doi: 10.5194/acp-2022-710, 2022.
4. [Patrick Aigner](#), [Moritz Makowski](#), [Andreas Luther](#), [Florian Dietrich](#), and **Jia Chen***: [Pyra: Automated EM27/SUN Greenhouse Gas Measurement Software](#), *Journal of Open Source Software*, 8, 5131, doi: 10.21105/joss.05131, 2023
5. [Florian Dietrich](#), **Jia Chen***, [Ankit Shekhar](#), [Sebastian Lober](#), [Konstantin Krämer](#), [Graham Leggett](#), [Carina van der Veen](#), [Ilona Velzeboer](#), [Hugo Denier van der Gon](#), [Thomas Roeckmann](#), "[Climate impact comparison of electric and gas-powered end-user appliances](#)", doi: 10.1002/essoar.10509970.1, *Earth's Future*, 11, e2022EF002877, doi: <https://doi.org/10.1029/2022EF002877>
6. [M. Reißmann](#), **J. Chen***, [G. Osterman](#), [F. Dietrich](#), [M. Makowski](#), [X. Zhao](#), [F. Hase](#), [M. Kiel](#), [Validation of OCO-2 target observations using MUCNet - Is it possible to capture urban XCO₂ gradients from space?](#), *Atmospheric Measurement Techniques*, 15, 6605–6623, doi: 10.5194/amt-15-6605-2022, 2022
7. [Zanger, B.](#), **Chen, J.***, [Sun, M.](#), and [Dietrich, F.](#): [Recovery of sparse urban greenhouse gas emissions](#), *Geoscientific Model Development*, 15, 7533–7556, doi: <https://doi.org/10.5194/gmd-15-7533-2022>, 2022.
8. [Balamurugan, V.](#), **Chen, J.***, [Qu, Z.](#), [Bi, X.](#), and [Keutsch, F. N.](#): [Secondary PM decreases significantly less than NO₂ emission reductions during COVID lockdown in Germany](#), *Atmos. Chem. Phys.*, 22, 7105–7129, doi: 10.5194/acp-22-7105-2022, 2022.
9. [Wenwen Zhang](#), [Hongtao Xiang](#), [Yuanxi Wang](#), [Xiao Bi](#), [Yanzhe Zhang](#), [Pengju Zhang](#), **Jia Chen**, [Lei Wang](#), [Yuanjin Zheng](#), [A Signal Response Visualization Gas Recognition Algorithm Based on a Wavelet Transform Coefficient Map-Capsule Network for Artificial Olfaction](#), *IEEE sensors journal*, doi: 10.1109/JSEN.2022.3184963, 2022.
10. [Alberti, C.](#), [Hase, F.](#), [Frey, M.](#), [Dubravica, D.](#), [Blumenstock, T.](#), [Dehn, A.](#), [Castracane, P.](#), [Surawicz, G.](#), [Harig, R.](#), [Baier, B. C.](#), [Bès, C.](#), [Bi, J.](#), [Boesch, H.](#), [Butz, A.](#), [Cai, Z.](#), **Chen, J.**, [Crowell, S. M.](#), [Deutscher, N. M.](#), [Ene, D.](#), [Franklin, J. E.](#), [García, O.](#), [Griffith, D.](#), [Grouiez, B.](#), [Grutter, M.](#), [Hamdouni, A.](#), [Houweling, S.](#), [Humpage, N.](#), [Jacobs, N.](#), [Jeong, S.](#), [Joly, L.](#), [Jones, N. B.](#), [Jougllet, D.](#), [Kivi, R.](#), [Kleinschek, R.](#), [Lopez, M.](#), [Medeiros, D. J.](#), [Morino, I.](#), [Mostafavipak, N.](#), [Müller, A.](#), [Ohyama, H.](#), [Palmer, P. I.](#), [Pathakoti, M.](#)

- Pollard, D. F., Raffalski, U., Ramonet, M., Ramsay, R., Sha, M. K., Shiomi, K., Simpson, W., Stremme, W., Sun, Y., Tanimoto, H., Té, Y., Tsidu, G. M., Velazco, V. A., Vogel, F., Watanabe, M., Wei, C., Wunch, D., Yamasoe, M., Zhang, L., and Orphal, J.: [Improved calibration procedures for the EM27/SUN spectrometers of the COCCON](#), *Atmos. Meas. Tech.*, 15, 2433–2463, doi: 10.5194/amt-15-2433-2022, 2022.
11. Luther, A., Kostinek, J., Kleinschek, R., Defratyka, S., Stanisavljevic, M., [Forstmaier, A.](#), Dandocsi, A., Scheidweiler, L., Dubravica, D., Wildmann, N., Hase, F., Frey, M. M., **Chen, J.**, [Dietrich, F.](#), Necki, J., Swolkien, J., Knotte, C., Vardag, S. N., Roiger, A., and Butz, A.: [Observational constraints on methane emissions from Polish coal mines using a ground-based remote sensing network](#), 22, 5859–5876, doi: 10.5194/acp-22-5859-2022, 2022.
 12. [Gensheimer, J.](#), Turner, A. J., Köhler, P., Frankenberg, C., and **Chen, J.***: [A Convolutional Neural Network for Spatial Downscaling of Satellite-Based Solar-Induced Chlorophyll Fluorescence \(SIFnet\)](#), *Biogeosciences*, 19, 1777–1793, doi: 10.5194/bg-19-1777-2022, 2022.
 13. [V. Balamurugan](#), V. Balamurugan, and **J. Chen***, [“Importance of ozone precursors information in modelling urban surface ozone variability using machine learning model”](#), *Scientific reports*, 12, 5646, doi: 10.1038/s41598-022-09619-6, 2022
 14. [Xiangwei Cheng](#), [Wenwen Zhang](#), [Adrian Wenzel](#), **Jia Chen***, [“Stacked ResNet-LSTM and CORAL model for multi-site air quality prediction”](#), *Neural Computing and Applications*, doi: 10.1007/s00521-022-07175-8, 2022.
 15. Kuhlmann, G., Chan, K. L., Donner, S., Zhu, Y., Schwaerzel, M., Dörner, S., **Chen, J.**, Hueni, A., [Nguyen, D. H.](#), Damm, A., Schütt, A., [Dietrich, F.](#), Brunner, D., Liu, C., Buchmann, B., Wagner, T., and Wenig, M.: [Mapping the spatial distribution of NO₂ with in situ and remote sensing instruments during the Munich NO₂ imaging campaign](#), *Atmos. Meas. Tech.*, doi: 10.5194/10.5194/amt-15-1609-2022, 2021.
 16. [V. Balamurugan](#), **J. Chen***, [X. Bi](#), Z. Qu, [J. Gensheimer](#), [A. Shekhar](#), [S. Bhattacharjee](#), F. Keutsch, [“Tropospheric NO₂ and O₃ response to COVID-19 lockdown restrictions at the national and urban scales in Germany”](#), *Journal of Geophysical Research: Atmospheres*, 126, e2021JD035440, doi: 10.1029/2021JD035440, 2021
 17. Taylor S. Jones, Jonathan E. Franklin, **Jia Chen**, [Florian Dietrich](#), Kristian D. Hajny, [Johannes C. Paetzold](#), [Adrian Wenzel](#), Conor Gately, Elaine Gottlieb, Harrison Parker, Manvendra Dubey, Frank Hase, Paul B. Shepson, Levi H. Mielke, and Steven C. Wofsy, [“Assessing Urban Methane Emissions using Column Observing Portable FTIR Spectrometers and a Novel Bayesian Inversion Framework”](#), *Atmos. Chem. Phys.*, 21, 13131–13147, doi: 10.5194/acp-21-13131-2021, 2021
 18. [Jose Vargas Rivero](#), Thiemo Gerbich, Boris Buschardt, **Jia Chen***, [“Data Augmentation of Automotive LIDAR Point Clouds under Adverse Weather Situations”](#), *Sensors*, doi: 10.3390/s21134503, 2021
 19. [Wenwen Zhang](#), Lei Wang, **Jia Chen***, [Xiao Bi](#), Chenshen Chen, [Jun Zhang](#), Volker Hans, [“A Novel Gas Recognition and Concentration Estimation Model for an Artificial Olfactory System with a Gas Sensor Array”](#), *IEEE Sensors Journal*, doi: 10.1109/JSEN.2021.3091582, 2021
 20. [Johannes Gensheimer](#), Alex Turner, [Ankit Shekhar](#), [Adrian Wenzel](#), Frank N. Keutsch, **Jia Chen***, [“What are different measures of mobility changes telling us about emission reductions during the COVID-19 pandemic?”](#), *Journal of Geophysical Research: Atmospheres*, doi: 10.1029/2021JD034664, 2021
 21. [Wenwen Zhang](#), Wenxin Xiao, **Jia Chen***, Lei Wang, [Xiao Bi](#), [“A Novel Gas Recognition and Concentration Detection Algorithm for Artificial Olfaction”](#), *IEEE Transactions on Instrumentation & Measurement*, doi: 10.1109/TIM.2021.3071313, 2021
 22. [Jose Vargas Rivero](#), Thiemo Gerbich, Boris Buschardt, **Jia Chen***, [“The Effect of Spray Water on an Automotive LIDAR Sensor: A Real-Time Simulation Study”](#), *IEEE Transactions on Intelligent Vehicles*,

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23. [Florian Dietrich](#), [Jia Chen*](#), [Benno Voggenreiter](#), [Patrick Aigner](#), [Nico Nachtigall](#), [Björn Reger](#), “[MUCCnet: Munich Urban Carbon Column network](#)”, *Atmospheric Measurement Techniques*, 14, 1111–1126, doi: 10.5194/amt-14-1111-2021, 2021
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24. [A. Shekhar](#), [J. Chen*](#), [S. Bhattacharjee](#), [A. Buras](#), [A. O. Castro](#), [C. Zang](#), [A. Rammig](#), “[Capturing the impact of the 2018 European drought and heat across different vegetation types using OCO-2 solar-induced fluorescence](#)”, *Remote Sensing*, 12(19), 3249, doi: 10.3390/rs12193249, 2020.
25. [Q. Tu](#), [F. Hase](#), [T. Blumenstock](#), [R. Kivi](#), [P. Heikkinen](#), [M. K. Sha](#), [U. Raffalski](#), [J. Landgraf](#), [A. Lorente](#), [T. Borsdorff](#), [H. Chen](#), [F. Dietrich](#), [J. Chen](#): “[Intercomparison of atmospheric CO₂ and CH₄ abundances on regional scales in boreal areas using Copernicus Atmosphere Monitoring Service \(CAMS\) analysis, Collaborative Carbon Column Observing Network \(COCCON\) spectrometers, and Sentinel-5 Precursor satellite observations](#)”, *Atmospheric Measurement Techniques*, 13, 4751–4771, doi: 10.5194/amt-13-4751-2020, 2020.
26. [A. Forstmaier](#), [A. Shekhar](#), [J. Chen*](#), “[Mapping of Eucalyptus in Natura 2000 areas using Sentinel 2 imagery and artificial neural networks](#)”, *Remote Sensing*, 12(14), 2176, doi: 10.3390/rs12142176, 2020.
27. [A. O. Castro](#), [J. Chen](#), [C. S. Zang](#), [A. Shekhar](#), [J. C. Jimenez](#), [S. Bhattacharjee](#), [M. Kindu](#), [V. H. Morales](#), [A. Rammig](#), “[OCO-2 solar-induced chlorophyll fluorescence variability across ecoregions of the Amazon basin and the extreme drought effects of El Niño \(2015–2016\)](#)”, *Remote Sensing*, 12(7), 1202, doi: 10.3390/rs12071202, 2020.
28. [L. Lan](#), [H. Ghasemifard](#), [Y. Yuan](#), [S. Hachinger](#), [X. Zhao](#), [S. Bhattacharjee](#), [X. Bi](#), [Y. Bai](#), [A. Menzel](#), [J. Chen*](#), “[Assessment of urban CO₂ measurement and source attribution in Munich based on TDLAS-WMS and trajectory analysis](#)”, *Atmosphere*, 11(1), 58, doi: 10.3390/atmos11010058, 2020.
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33. [Ying Zhu](#), [Jia Chen*](#), [Xiao Bi](#), [Gerrit Kuhlmann](#), [Ka Lok Chan](#), [Florian Dietrich](#), [Dominik Brunner](#), [Sheng Ye](#), [Mark Wenig](#), “[Spatial and temporal representativeness of point measurements for nitrogen dioxide pollution levels in cities](#)”, *Atmospheric Chemistry and Physics*, 20, 13241–13251, doi: 10.5194/acp-20-13241-2020, 2020
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35. [Xu Wang](#), [Mingnian Wang](#), [Jia Chen](#), [Tao Yan](#), [Yifan Bao](#), [Jinyu Chen](#), [Pengcheng Qin](#), [Kunjie Li](#), [Tao Deng](#), [Guanfeng Yan](#), “[Analysis of Calculation of Fresh-Air Demand for Road Tunnel Ventilation Design in China](#)”, *Tunnelling and Underground Space Technology*, 103, 103469, doi: 10.1016/j.tust.2020.103469, 2020

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