Amir H. Souri, Ph.D.

Atmospheric Chemistry and Dynamics Laboratory, NASA Goddard Space Flight Center, Greenbelt, MD, USA/GESTAR II, Morgan State University, Baltimore, MD, USA

Education

Ph.D. (2018)	Atmospheric Sciences, University of Houston, 2015-2018 ***Thesis**: Constraining NO_x emissions using spaceborne and airborne remotely sensed NO_2 observations*
M.S. (2014)	Remote Sensing, University of Tehran, 2011-2014 ***Thesis**: Water vapor modeling and atmospheric corrections on InSAR technique*
B.S. (2011)	Civil-Surveying and Geomatics Eng., University of Tehran, 2007-2011 ***Thesis**: Hydrological modeling of precipitation and flood using geostatistical tools*

Current Employment

Associate Research Scientist, NASA Goddard Space Flight Center (614)/GESTAR II (Morgan State University)

Work Experience

Associate Research Scientist, NASA Goddard Space Flight Center (614)/GESTAR II (Morgan State University)
Atmospheric Physicist, Harvard-Smithsonian Center for Astrophysics, 2018-2023
Research Assistant, University of Houston, 2015-2018
Teaching Assistant, University of Tehran, 2013-2014

Professional Memberships, Awards, Honors

American Geophysical Union

American Meteorological Society

TEMPO Group Achievement Award, 2020, Awarded by NASA

Outstanding Academic Achievement in Atmospheric Sciences, 2017, University of Houston: for maintaining high GPA and publishing numerous papers during the academic year.

Outstanding Academic Achievement in Atmospheric Sciences, 2016, University of Houston: for maintaining a high GPA and publishing numerous papers during the academic year.

Presidential Fellowship, 2015, University of Houston: for having a strong CV among Ph.D. applicants.

Awarded Grants

As PI

(6) Beyond HCHO/NO_2: A Comprehensive Investigation of Hourly-Varying Ozone Production Rates and Their Sensitivities to Weather, Chemistry, and Emissions, 2025-2027, **PI: A.H. Souri**, Co-Is: Sarah Strode, Bryan Duncan, Junhua Liu, TEMPO Science Team, **Amount (*total*): $597,000**

(5) Long-term Maps of Satellite-Based Ozone Production Rates using OMI, OMPS, and TROPOMI HCHO and NO2 Observations via Empirical and Machine Learning Methods: Insights from NASA's Air Quality Campaign, 2023-2025, **PI: A.H. Souri**, Co-I: Gonzalo Gonzalez Abad, ACMAP-Aura, **Amount (*total*): $575,718**

(4) Improved assessment of recent trends in NOx and VOC emissions and ozone production sensitivity regimes using satellite data, 2023-2025, PI: Matthew Johnson (NASA AMES), Co-Is: **A.H. Souri**, Rajesh Kumar, ACMAP-Aura, **Amount (*my share*): ~$150,000**

(3) Remote-Sensing of Surface-Level Ozone Sensitivity to Nitrogen Oxides and Volatile Organic Compounds, 2021-2023, PI: Matthew Johnson (NASA AMES), Co-Is: Sajeev Philip, Rajesh Kumar, **A. H. Souri**, and Jeff Geddes, NASA Aura Science Team, ***Amount (my share):* $168,909**

(2) Algorithm maintenance for SAO standard OMI products (HCHO, BrO, OClO, etc.), 2020-2023, PI: Kelly Chance (SAO), Co-Is: Xiong Liu, Gonzalo González Abad, Caroline Nowlan, Chris Miller, Raid Suleiman, Helen Wang, and **A. H. Souri**, NASA Aura Science Team, ***Amount (total):* $1,091,802**

(1) Corn Sweat: Contribution of Plant Transpiration during Heatwaves, 2019-2020, **PI: A. H. Souri**, Co-I: H. Wang (SAO), Scholarly Studies Awards Grant from the Smithsonian Institution, ***Amount (total):* $74,425**

Peer-Reviewed Journals

(*n*=41, fraction of leading authorship= 50%, H-index: 22)

Leading author or my contribution is equal to the first author's

Featured

Based on the ratio of leading-authored papers to the total; a made-up metric to gauge the capability of being independent.

(41) **Souri, A. H.**, González Abad, G., Duncan, B. N., and Oman, L. D.: Beyond HCHO/NO_2: Global Daily Maps of Net Ozone Production Rates and Sensitivities Constrained by Satellite Observations (2005–2023), EGUsphere [preprint], https://doi.org/10.5194/egusphere-2025-1679, 2025.

(40) Duncan, B.N., Anderson, D.C., Fiore, A.M., Joiner, J., Krotkov, N.A., Li, C., Millet, D.B., Nicely, J.M., Oman, L.D., St. Clair, J.M., Shutter, J.D., **Souri, A.H.**, Strode, S.A., Weir, B., Wolfe, G.M., Worden, H.M., Zhu, Q., 2024. Opinion: Beyond global means – novel space-based approaches to indirectly constrain the concentrations of and trends and variations in the tropospheric hydroxyl radical (OH). Atmospheric Chemistry and Physics 24, 13001–13023. https://doi.org/10.5194/acp-24-13001-2024

(39) **Souri, A.H.**, González Abad, G., Wolfe, G.M., Verhoelst, T., Vigouroux, C., Pinardi, G., Compernolle, S., Langerock, B., Duncan, B.N., Johnson, M.S., 2025. Feasibility of robust estimates of ozone production rates using a synergy of satellite observations, ground-based remote sensing, and models. Atmospheric Chemistry and Physics 25, 2061–2086. https://doi.org/10.5194/acp-25-2061-2025

(38) **Souri, A.H.**, Duncan, B.N., Strode, S.A., Anderson, D.C., Manyin, M.E., Liu, J., Oman, L.D., Zhang, Z., Weir, B., 2024. Enhancing long-term trend simulation of the global tropospheric hydroxyl (TOH) and its drivers from 2005 to 2019: a synergistic integration of model simulations and satellite observations. Atmospheric Chemistry and Physics 24, 8677–8701. https://doi.org/10.5194/acp-24-8677-2024

(37) Anderson, D.C., Duncan, B.N., Liu, J., Nicely, J.M., Strode, S.A., Follette-Cook, M.B., **Souri, A.H.**, Ziemke, J.R., González-Abad, G., Ayazpour, Z., 2024. Trends and Interannual Variability of the Hydroxyl Radical in the Remote Tropics During Boreal Autumn Inferred From Satellite Proxy Data. Geophysical Research Letters 51, e2024GL108531. https://doi.org/10.1029/2024GL108531

(36) Hall, K.R., Wang, H., **Souri, A.H.**, Liu, X., Chance, K., 2024. Ozone Anomalies in Dry Intrusions Associated With Atmospheric Rivers. Journal of Geophysical Research: Atmospheres 129, e2023JD039949. https://doi.org/10.1029/2023JD039949

(35) Chong, H., González Abad, G., Nowlan, C.R., Chan Miller, C., Saiz-Lopez, A., Fernandez, R.P., Kwon, H.-A., Ayazpour, Z., Wang, H., **Souri, A.H.**, Liu, X., Chance, K., O'Sullivan, E., Kim, J., Koo, J.-H., Simpson, W.R., Hendrick, F., Querel, R., Jaross, G., Seftor, C., Suleiman, R.M., 2024. Global retrieval of stratospheric and tropospheric BrO columns from the Ozone Mapping and Profiler Suite Nadir Mapper (OMPS-NM) on board the Suomi-NPP satellite. Atmospheric Measurement Techniques 17, 2873–2916. https://doi.org/10.5194/amt-17-2873-2024

(34) Conway, E.K., **Souri, A.H.**, Benmergui, J., Sun, K., Liu, X., Staebell, C., Chan Miller, C., Franklin, J., Samra, J., Wilzewski, J., Roche, S., Luo, B., Chulakadabba, A., Sargent, M., Hohl, J., Daube, B., Gordon, I., Chance, K., Wofsy, S., 2024. Level0 to Level1B processor for MethaneAIR. Atmospheric Measurement Techniques 17, 1347–1362. https://doi.org/10.5194/amt-17-1347-2024

(33) Chulakadabba, A., Sargent, M., Lauvaux, T., Benmergui, J.S., Franklin, J.E., Chan Miller, C., Wilzewski, J.S., Roche, S., Conway, E., **Souri, A.H.,** Sun, K., Luo, B., Hawthrone, J., Samra, J., Daube, B.C., Liu, X., Chance, K., Li, Y., Gautam, R., Omara, M., Rutherford, J.S., Sherwin, E.D., Brandt, A., Wofsy, S.C., 2023. Methane point source quantification using MethaneAIR: a new airborne imaging spectrometer. Atmospheric Measurement Techniques 16, 5771–5785. https://doi.org/10.5194/amt-16-5771-2023

(32) **Souri, A.H.**, Kumar, R., Chong, H., Golbazi, M., Knowland, K.E., Geddes, J., Johnson, M.S., 2023. Decoupling in the vertical shape of HCHO during a sea breeze event: The effect on trace

gas satellite retrievals and column-to-surface translation. Atmospheric Environment 309, 119929. https://doi.org/10.1016/j.atmosenv.2023.119929

(31) Kwon, H.-A., Abad, G.G., Nowlan, C.R., Chong, H., **Souri, A.H.,** Vigouroux, C., Röhling, A., Kivi, R., Makarova, M., Notholt, J., Palm, M., Winkler, H., Té, Y., Sussmann, R., Rettinger, M., Mahieu, E., Strong, K., Lutsch, E., Yamanouchi, S., Nagahama, T., Hannigan, J.W., Zhou, M., Murata, I., Grutter, M., Stremme, W., De Mazière, M., Jones, N., Smale, D., Morino, I., 2023. Validation of OMPS Suomi NPP and OMPS NOAA-20 Formaldehyde Total Columns With NDACC FTIR Observations. Earth and Space Science 10, e2022EA002778. https://doi.org/10.1029/2022EA002778

(30) Johnson, M.S., **Souri, A.H.**, Philip, S., Kumar, R., Naeger, A., Geddes, J., Judd, L., Janz, S., Chong, H., Sullivan, J., 2023. Satellite remote-sensing capability to assess tropospheric-column ratios of formaldehyde and nitrogen dioxide: case study during the Long Island Sound Tropospheric Ozone Study 2018 (LISTOS 2018) field campaign. Atmospheric Measurement Techniques 16, 2431–2454. https://doi.org/10.5194/amt-16-2431-2023

(29) Pan, S., Gan, L., Jung, J., Yu, W., Roy, A., Diao, L., Jeon, W., **Souri, A.H.**, Gao, H.O., Choi, Y., 2023. Quantifying the premature mortality and economic loss from wildfire-induced PM2.5 in the contiguous U.S. Science of The Total Environment 875, 162614. https://doi.org/10.1016/j.scitotenv.2023.162614, *Featured in theguardian, CBC, Houston Chronicle*

(28) **Souri, A.H.**, Johnson, M.S., Wolfe, G.M., Crawford, J.H., Fried, A., Wisthaler, A., Brune, W.H., Blake, D.R., Weinheimer, A.J., Verhoelst, T., Compernolle, S., Pinardi, G., Vigouroux, C., Langerock, B., Choi, S., Lamsal, L., Zhu, L., Sun, S., Cohen, R.C., Min, K.-E., Cho, C., Philip, S., Liu, X., Chance, K., 2023. Characterization of errors in satellite-based HCHO/NO2 tropospheric column ratios with respect to chemistry, column-to-PBL translation, spatial representation, and retrieval uncertainties. Atmospheric Chemistry and Physics 23, 1963–1986. https://doi.org/10.5194/acp-23-1963-2023

(27) Jung, J., Choi, Y., **Souri, A.H.**, Mousavinezhad, S., Sayeed, A., Lee, K., 2022. The Impact of Springtime-Transported Air Pollutants on Local Air Quality With Satellite-Constrained NOx Emission Adjustments Over East Asia. Journal of Geophysical Research: Atmospheres 127, e2021JD035251. https://doi.org/10.1029/2021JD035251

(26) **Souri, A.H.**, Chance, K., Sun, K., Liu, X., Johnson, M.S., 2022. Dealing with spatial heterogeneity in pointwise-to-gridded- data comparisons. Atmospheric Measurement Techniques 15, 41–59. https://doi.org/10.5194/amt-15-41-2022

(25) **Souri, A.H**., Chance, K., Bak, J., Nowlan, C.R., González Abad, G., Jung, Y., Wong, D.C., Mao, J., Liu, X., 2021. Unraveling pathways of elevated ozone induced by the 2020 lockdown in

Europe by an observationally constrained regional model using TROPOMI. Atmospheric Chemistry and Physics 21, 18227–18245. https://doi.org/10.5194/acp-21-18227-2021

(24) Pouyaei, A., Sadeghi, B., Choi, Y., Jung, J., **Souri, A.H.**, Zhao, C., Song, C.H., 2021. Development and Implementation of a Physics-Based Convective Mixing Scheme in the Community Multiscale Air Quality Modeling Framework. Journal of Advances in Modeling Earth Systems 13, e2021MS002475. https://doi.org/10.1029/2021MS002475

(23) **Souri, A.H.**, Nowlan, C.R., González Abad, G., Zhu, L., Blake, D.R., Fried, A., Weinheimer, A.J., Woo, J.-H., Zhang, Q., Chan Miller, C.E., Liu, X., Chance, K., 2020. An Inversion of NO_x and NMVOC Emissions using Satellite Observations during the KORUS-AQ Campaign and Implications for Surface Ozone over East Asia. Atmospheric Chemistry and Physics 20, 9837–9854. https://doi.org/10.5194/acp-2020-220

(22) **Souri, A.H.,** Choi, Y., Kodros, J.K., Jung, J., Shpund, J., Pierce, J.R., Lynn, B.H., Khain, A., Chance, K., 2020. Response of Hurricane Harvey's rainfall to anthropogenic aerosols: A sensitivity study based on spectral bin microphysics with simulated aerosols. Atmospheric Research 242, 104965. https://doi.org/10.1016/j.atmosres.2020.104965

(21) **Souri, A.H.,** Wang, H., Abad, G.G., Liu, X., Chance, K., 2020. Quantifying the Impact of Excess Moisture From Transpiration From Crops on an Extreme Heat Wave Event in the Midwestern U.S.: A Top-Down Constraint From Moderate Resolution Imaging Spectroradiometer Water Vapor Retrieval. Journal of Geophysical Research: Atmospheres 125, e2019JD031941. https://doi.org/10.1029/2019JD031941

(20) **Souri, A.H.,** Nowlan, C.R., Wolfe, G.M., Lamsal, L.N., Chan Miller, C.E., Abad, G.G., Janz, S.J., Fried, A., Blake, D.R., Weinheimer, A.J., Diskin, G.S., Liu, X., Chance, K., 2020. Revisiting the effectiveness of $HCHO/NO_2$ ratios for inferring ozone sensitivity to its precursors using high resolution airborne remote sensing observations in a high ozone episode during the KORUS-AQ campaign. Atmospheric Environment 117341. https://doi.org/10.1016/j.atmosenv.2020.117341

(19) Jung, J., **Souri, A.H.**, Wong, D.C., Lee, S., Jeon, W., Kim, J., Choi, Y., 2019. The Impact of the Direct Effect of Aerosols on Meteorology and Air Quality Using Aerosol Optical Depth Assimilation During the KORUS-AQ Campaign. Journal of Geophysical Research: Atmospheres 124, 8303–8319. https://doi.org/10.1029/2019JD030641

(18) Kochanski, A.K., Mallia, D.V., Fearon, M.G., Mandel, J., **Souri, A.H.**, Brown, T., 2019. Modeling Wildfire Smoke Feedback Mechanisms Using a Coupled Fire-Atmosphere Model With a Radiatively Active Aerosol Scheme. Journal of Geophysical Research: Atmospheres 124, 9099–9116. https://doi.org/10.1029/2019JD030558, *Highlighted in JGR: Atmospheres, Featured in EOS, Science Daily, and Phys.org*

(17) Wang, H., **Souri, A.H.**, González Abad, G., Liu, X., Chance, K., 2019. Ozone Monitoring Instrument (OMI) Total Column Water Vapor version 4 validation and applications.

Atmospheric Measurement Techniques 12, 5183–5199. https://doi.org/10.5194/amt-12-5183-2019

(16) Gonzalez Abad, G., **Souri, A.H.**, Bak, J., Chance, K., Flynn, L.E., Krotkov, N.A., Lamsal, L., Li, C., Liu, X., Miller, C.C., Nowlan, C.R., Suleiman, R., Wang, H., 2019. Five decades observing Earth's atmospheric trace gases using ultraviolet and visible backscatter solar radiation from space. Journal of Quantitative Spectroscopy and Radiative Transfer 238, 106478. https://doi.org/10.1016/j.jqsrt.2019.04.030

(15) Kotsakis, A., Choi, Y., **Souri, A.H.**, Jeon, W., Flynn, J., 2019. Characterization of Regional Wind Patterns Using Self-Organizing Maps: Impact on Dallas–Fort Worth Long-Term Ozone Trends. J. Appl. Meteor. Climatol. 58, 757–772. https://doi.org/10.1175/JAMC-D-18-0045.1

(14) **Souri, A.H.**, Choi, Y., Pan, S., Curci, G., Nowlan, C.R., Janz, S.J., Kowalewski, M.G., Liu, J., Herman, J.R., Weinheimer, A.J., 2018. First Top-Down Estimates of Anthropogenic NOx Emissions Using High-Resolution Airborne Remote Sensing Observations. Journal of Geophysical Research: Atmospheres 123, 3269–3284. https://doi.org/10.1002/2017JD028009

(13) Jeon, W., Choi, Y., **Souri, A.H.**, Roy, A., Diao, L., Pan, S., Lee, H.W., Lee, S.-H., 2018. Identification of chemical fingerprints in long-range transport of burning induced upper tropospheric ozone from Colorado to the North Atlantic Ocean. Science of The Total Environment 613–614, 820–828. https://doi.org/10.1016/j.scitotenv.2017.09.177

(12) **Souri, A. H.**, Choi, Y., Jeon, W., Kochanski, A.K., Diao, L., Mandel, J., Bhave, P.V., Pan, S., 2017. Quantifying the Impact of Biomass Burning Emissions on Major Inorganic Aerosols and Their Precursors in the U.S. Journal of Geophysical Research: Atmospheres 122, 12,020-12,041. https://doi.org/10.1002/2017JD026788

(11) **Souri, A. H.**, Choi, Y., Jeon, W., Woo, J.-H., Zhang, Q., Kurokawa, J., 2017. Remote sensing evidence of decadal changes in major tropospheric ozone precursors over East Asia. Journal of Geophysical Research: Atmospheres 122, 2474–2492. https://doi.org/10.1002/2016JD025663, *Featured in JGR and NSM.*

(10) Diao, L., Choi, Y., Czader, B., Li, X., Pan, S., Roy, A., **Souri, A.H.**, Estes, M., Jeon, W., 2016. Discrepancies between modeled and observed nocturnal isoprene in an urban environment and the possible causes: A case study in Houston. Atmospheric Research 181, 257–264. https://doi.org/10.1016/j.atmosres.2016.07.009

(9) Jeon, W., Choi, Y., Percell, P., **Souri, A.H.**, Song, C.-K., Kim, S.-T., Kim, J., 2016. Computationally efficient air quality forecasting tool: implementation of STOPS v1.5 model into CMAQ v5.0.2 for a prediction of Asian dust. Geoscientific Model Development 9, 3671–3684. https://doi.org/10.5194/gmd-9-3671-2016

(8) **Souri, A.H.**, Choi, Y., Li, X., Kotsakis, A., Jiang, X., 2016. A 15-year climatology of wind pattern impacts on surface ozone in Houston, Texas. Atmospheric Research 174–175, 124–134. https://doi.org/10.1016/j.atmosres.2016.02.007

(7) **Souri, A.H.**, Choi, Y., Jeon, W., Li, X., Pan, S., Diao, L., Westenbarger, D.A., 2016. Constraining NO_x emissions using satellite NO_2 measurements during 2013 DISCOVER-AQ Texas campaign. Atmospheric Environment 131, 371–381. https://doi.org/10.1016/j.atmosenv.2016.02.020

(6) Diao, L., Roy, A., Czader, B., Pan, S., Jeon, W., **Souri, A.H.**, Choi, Y., 2016. Modeling the effect of relative humidity on nitrous acid formation in the Houston area. Atmospheric Environment 131, 78–82. https://doi.org/10.1016/j.atmosenv.2016.01.053

(5) Pan, S., Choi, Y., Roy, A., Li, X., Jeon, W., **Souri, A.H.**, 2015. Modeling the uncertainty of several VOC and its impact on simulated VOC and ozone in Houston, Texas. Atmospheric Environment 120, 404–416. https://doi.org/10.1016/j.atmosenv.2015.09.029

(4) Choi, Y., **Souri, A.H.**, 2015. Chemical condition and surface ozone in large cities of Texas during the last decade: Observational evidence from OMI, CAMS, and model analysis. Remote Sensing of Environment 168, 90–101. https://doi.org/10.1016/j.rse.2015.06.026

(3) Sharifi, M.A., **Souri, A.H.**, 2015. A hybrid LS-HE and LS-SVM model to predict time series of precipitable water vapor derived from GPS measurements. Arab J Geosci 8, 7257–7272. https://doi.org/10.1007/s12517-014-1716-0

(2) **Souri, A.H.**, Vajedian, S., 2015. Dust storm detection using random forests and physical-based approaches over the Middle East. J Earth Syst Sci, 124, 1127–1141. https://doi.org/10.1007/s12040-015-0585-6

(1) Choi, Y., **Souri, A.H.**, 2015. Seasonal behavior and long-term trends of tropospheric ozone, its precursors and chemical conditions over Iran: A view from space. Atmospheric Environment 106, 232–240. https://doi.org/10.1016/j.atmosenv.2015.02.012

Projects and Technical Reports

NASA TEMPO Science Team, 2025-present, Understanding the hourly variation of HCHO and NO2 columns along with PO_3

NASA ACMAP (2), 2023-present, A joint inversion of NOx/VOC using multiple satellites

NASA ACMAP (1), 2023-present, PO_3 estimates from space

NASA TOH Estimates from Space, 2023-present, Enhancing long-term trends of TOH using satellites

EDF's MethaneSAT/MethaneAIR, 2020-2023, OSSEs simulations (synthetic L1 and L2 products), geo-location corrections using computer vision techniques, denoising

NASA Aura (2), 2021-2023, Spatial heterogeneity, satellite-based HCHO/NO_2 ratios

NASA Aura (1), 2019-2021, Application of OMI/OMPS satellites in atmospheric sciences

GIST, 2018, Development of a convective transport scheme for the CMAQ model

NIER, 2017, Integrating surface and satellite observations to provide an optimal estimate of surface distribution of particulate matters

TCEQ, 2016, Biomass burning impacts on air quality in the U.S.: Evidence from the CMAQ model in 2012-2014

AQRP, 2015, Inverse modeling of NO_x emissions in Southeast Texas using OMI NO_2

Professional Community Service

Proposals Review Panel: NASA

Journal Article Reviewer (55 papers): *Nature Communication, Geophysical Research Letter, Journal of Geophysical Research: Atmospheres, Atmospheric Chemistry and Physics, Atmospheric Environment, Atmospheric Research, Environmental Science and Technology, Scientific Reports, Remote Sensing, Remote Sensing Letters, International Journal of Remote Sensing, Asia-Pacific Journal of Atmospheric Sciences, Elementa: Science of the Anthropocene, Atmospheric Pollution Research, Arabian Journal of Geosciences, Resources, Conservation, and Recycling.*

Conferences, Meetings and Symposia

Invited

Johnson, M.S., Jung, J., **Souri, A.H.**, Kumar, R., 2025. Improved Assessment of Recent Trends in NO_x and VOC Emissions and Ozone Production Sensitivity Regimes Using Satellite Data (Invited Presentation). Presented at the 105th AMS Annual Meeting, New Orleans.

Souri, A.H., Gonzalez Abad, G., Wolfe, G.M., Verhoelst, T., Vigouroux, C., Pinardi, G., Compernolle, S., Langerock, B., Duncan, B.N., Johnson, M.S., 2025. Beyond Binary Maps Using HCHO/NO2 Ratios: First Estimates of Ozone Production Rates Along With Spatially-Varying Ozone Sensitivity Maps Using Satellite Retrievals in Conjunction with Deep Neural Networks. Presented at the 105th Annual AMS Meeting 2025, New Orleans.

Amir Souri, G. González Abad, G. M. Wolfe, T. Verhoelst, C. Vigouroux, G. Pinardi, S. Compernolle, B. Langerock, B. N. Duncan, and M. S. Johnson. Early Findings in Satellite-based Ozone Production Rate Estimates: Insights from Numerous NASA/NOAA Atmospheric Composition Campaigns, The Quadrennial Ozone Symposium, Boulder, CO, 15–19 July 2024.

Jacob Bushey, Joshua Benmergui, Julian Kostinek, Adam Brandt, Christopher Chan Miller, Kelly Chance, Apisada Chulakadabba, Eamon Conway, Bruce Daube, Jonathan Franklin, Ritesh Gautam, Jacob Hawthorne, Thomas Lauvaux, Yang Li, Xiong Liu, Bingkun Luo, Mark Omara, Sebastien Roche, Jeff Rutherford, Jenna Samra, Maryann Sargent, Evan Sherwin, **Amir Hossein Souri,** Kang Sun, Jonas Wilzewski, Steven C Wofsy, Geostatistical Inverse Modeling of Methane Area Source Emissions from Oil and Gas using MethaneAIR Observations, AMS 2024:

Daniel C Anderson, Bryan Neal Duncan, Julie M Nicely, Sarah A Strode, Junhua Liu, Melanie B Follette-Cook, **Amir Souri**. Trends and Variability of the Hydroxyl Radical in the Tropics Determined from Satellite Observations of its Drivers, AMS 2024.

Matthew S Johnson, **Amir Souri**, Sajeev Philip, Rajesh Kumar, Jia Jung, Scott Meech, How Well Can We Assess Ozone Production Sensitivity Regimes Using Satellite Remote-sensing?, AMS 2024

Amir Souri, Gonzalo González Abad, Glenn Wolfe, Matthew Johnson, Bryan Duncan, Tijl Verhoelst, Early Results of Ozone Production Rate Estimates Using Satellite Observations: Insights From Numerous NASA Atmospheric Composition Campaigns, EGU 2024.

Bryan Duncan, **Amir Souri**, Sarah Strode, Daniel Anderson, Michael Manyin, Junhua Liu, Luke Oman, and Brad Weir, Exploring Biases and Long-term Trends in Tropospheric OH: A Synergistic Approach with Model Simulations, Interpretable Machine Learning, and Satellite Observations, EGU 2024:

Amir Souri, Rajesh Kumar, Heesung Chong, Maryam Golbazi, K Emma Knowland, Jeffrey Geddes, Matthew S Johnson, Unusual formaldehyde (HCHO) vertical profile shapes during a sea breeze event: Implications for geostationary satellite trace gas retrievals, AGU 2023:

Amir Souri, Bryan N Duncan, Sarah A Strode, Daniel C Anderson, Michael Manyin, Luke Oman, Junhua Liu, Brad Weir, Enhancing Long-Term Trend Simulation of OH Through the Synergy of Model Simulations and Aura Ozone Monitoring Instrument (OMI) NO2 and HCHO Retrievals, AGU 2023.

Julie M Nicely, Daniel C Anderson, Bryan Duncan, Junhua Liu, Sarah A Strode, Melanie B Follette-Cook, **Amir H Souri**, Airborne observations in support of a satellite observation-based OH product, AGU 2023.

Apisada Chulakadabba, Maryann R Sargent, Thomas Lauvaux, Joshua Simon Benmergui, Jonathan E Franklin, Christopher Chan Miller, Jonas Wilzewski, Sébastien Roche, Eamon Conway, **Amir Souri**, Kang Sun, Bingkun Luo, Jacob Hohl, Jenna Samra, Bruce C Daube, Xiong Liu, Kelly Chance, Yang Li, Ritesh Gautam, Mark Omara, Jeffrey Rutherford, Evan D Sherwin, Adam R Brandt, Steven C Wofsy, Unlocking the Potential of MethaneAIR: Quantification Techniques, Challenges, and Next Steps, AGU 2023.

Bingkun Luo, Xiong Liu, Jonathan E Franklin, Eamon Conway, Kang Sun, David Miller, Sébastien Roche, **Amir Souri**, Christopher Chan Miller, Jonas Wilzewski, Joshua Simon Benmergui, Kelly Chance, Steven C Wofsy, Sensor-level Pre-flight Calibration Analysis for MethaneSAT, AGU 2023.

Sebastien Roche, Christopher Chan Miller, **Amir Souri**, Jonas Wilzewski, Bingkun Luo, Jenna Samra, Maryann R Sargent, Jonathan E Franklin, Kang Sun, Kelly Chance, Xiong Liu, Steven C Wofsy, MethaneAIR Airglow Retrievals, AGU 2023.

Souri A., A Decoupled relationship between HCHO surface and columns during a sea breeze event, Seminar for NASA GSFC (614), 2023, Greenbelt, Maryland.

Souri, A., Johnson, M.S., Wolfe, G.M., Crawford, J., Fried, A., Wisthaler, A., Brune, W.H., Blake, D.R., Weinheimer, A., Verhoelst, T., Compernolle, S., Pinardi, G., Vigouroux, C., Langerock, B., Choi, S., Lamsal, L.N., Zhu, L., Sun, S., Cohen, R., Min, K.-E., Cho, C., Philip, S., Liu, X., Chance, K., 2023. A Complete Picture of Errors Precluding the Precise Diagnosis of Ozone

Chemical Regimes Using Satellite-Based HCHO/NO2 Ratios. Presented at the 103rd AMS Annual Meeting, AMS.

Souri, A.H., Miller, C.C., Liu, X., Roche, S., Wilzewski, J., Benmergui, J., Sun, K., Spurr, R.J.D., Franklin, J., Wofsy, S.C., Chance, K., 2023. MethaneSAT OSSE Simulation to Assess Errors in XCH4 Derived From the CO2 and O2 Proxy Methods. Presented at the 103rd AMS Annual Meeting, AMS.

Souri A., Characterization of errors in Satellite-based HCHO/NO2 ratios, Seminar for NASA GSFC (614), 2022, Greenbelt, Maryland.

Jonas Wilzewski, Sébastien Roche, Christopher Chan Miller, **Amir Souri**, Eamon Conway, Bingkun Luo, Jonathan E Franklin, Julian Kostinek, Jenna Samra, Kang Sun, Jacob Hohl, Xiong Liu, Kelly Chance, Steven C Wofsy, Development of the MethaneSAT Cloud Filter, Presented at the AGU Fall Meeting, 2022, AGU.

Bingkun Luo, Xiong Liu, Jonathan E Franklin, Eamon Conway, Kang Sun, **Amir Souri**, Christopher Chan Miller, Sebastien Roche, Jonas Simon Simon Wilzewski, Joshua Simon Benmergui, Kelly Chance, Steven C Wofsy, Development of the MethaneSAT L0-1B processor, Presented at the AGU Fall Meeting, 2022, AGU.

Jonathan E Franklin, Joshua Simon Benmergui, Kelly Chance, Apisada Chulakadabba, Bruce C Daube, Ritesh Gautam, Steve Hamburg, Tom Ingersoll, Xiong Liu, Bingkun Luo, Daniel J McCleese, Tom Melendez, Sara E Mikaloff-Fletcher, Christopher Chan Miller, Mark Omara, Sébastien Roche, Jenna Samra, Maryann R Sargent, **Amir Souri**, Kang Sun, Jonas Wilzewski, Steven C Wofsy, The MethaneSAT Mission: Progress and Future Plans, Presented at the AGU Fall Meeting, 2022, AGU.

Roche., S., Miller, C.E., Wilzewski, J., **Souri, A.**, et al., XCH4 and XCO2 proxies from MethaneAIR observations, Presented at the AGU Fall Meeting, 2022, AGU.

Souri A., Quantifying Changes in Man-made Emissions During the 2020 Lockdown Using Satellite Observations, Seminar for Harvard-Smithsonian Center for Astrophysics, 2022, Cambridge, Massachusetts.

Souri, A., Chance, K., Sun, K., Liu, X., Johnson, M.S., 2021. Modeling Spatial Heterogeneity in Satellite Validation Against Pointwise Measurements. Presented at the AGU Fall Meeting 2021, AGU.

Pouyaei, A., Sadeghi, B., Choi, Y., Jung, J., **Souri, A.**, Zhao, C., Song, C.H., 2021. Development and implementation of a physics-based convective mixing scheme in the Community Multiscale Air Quality (CMAQ) modeling framework. Presented at the AGU Fall Meeting 2021, AGU.

Hall, K., Wang, H., **Souri, A**., Chance, K., Liu, X., 2021. Tropospheric Ozone Anomalies Associated with Atmospheric Rivers. Presented at the AGU Fall Meeting 2021, AGU.

Santos, F., Geddes, J., **Souri, A.**, 2021. Classifying the Diurnal Variability in the Column Measurements of NO2 and Implications for Geostationary Monitoring. Presented at the AGU Fall Meeting 2021, AGU.

Amir Souri. Potential Application of Satellite-Based Water Vapor Columns for Improving Numerical Weather Models, with a View Towards Geostationary Monitoring, TEMPO, Varysian Hydromet Network

Amir Souri, Juseon Bak, Caroline R Nowlan, Gonzalo Gonzalez Abad, Yeonjin Jung, David Wong, Xiong Liu, Kelly Chance, Quantification of the Impact of the Lockdown on NOx and NMVOC Emissions over Europe and Implications for Surface Ozone and HOx Chemistry: A Non-Linear Multi-Species Inverse Modeling using TROPOMI, AGU 2020, Virtual.

Christopher Chan Miller, Jenna Samra, Kang Sun, Bruce C Daube, Jonathan E Franklin, Joshua Simon Benmergui, Peter Cheimets, Xiong Liu, **Amir Souri**, Yeonjin Jung, Kelly Chance, Martin H Ettenberg, Scottt Milligan, Steven C Wofsy, First results from MethaneAIR: An airborne simulation platform for the MethaneSAT mission, AGU 2020, Virtual.

Heesung Chong, Gonzalo Gonzalez Abad, Jhoon Kim, Christopher Chan Miller, Alfonso Saiz-Lopez, Rafael P Fernandez, Caroline R Nowlan, Xiong Liu, Kelly Chance, Ewan O'Sullivan, **Amir Souri**, Retrieval of bromine monoxide from the Ozone Mapping and Profiler Suite Nadir Mapper onboard the Suomi National Polar-orbiting Partnership satellite, AGU 2020, Virtual.

Souri A. H., Caroline R. Nowlan, Gonzalo González Abad, Lei Zhu, Donald R. Blake, Alan Fried, Andrew J. Weinheimer, Jung-Hun Woo, Qiang Zhang, Christopher E. Chan Miller, Xiong Liu, and Kelly Chance, Non-linear Joint Inversion of NOx and NMVOC Emissions Using Satellite Observations over East Asia, 19th CMAS Annual Meeting, Oct 2020, Virtual.

Adams, T.J., Geddes, J.A., Abad, G.G., **Souri, A.H.**, Miller, C., Nowlan, C.R., Jung, Y. and Chance, K. Early Results and New Insights into Tropospheric NO_2 Variability from a Network of Pandora Spectrometers in a Coastal Urban Environment. In 100th American Meteorological Society Annual Meeting. 2020, Boston, MA.

Souri A.H., H. Wang, G. Gonzalez Abad, X. Liu, and K. Chance, Corn Sweat, Heat Wave, The Midwest AGU Fall Meeting, San Francisco, CA, 2019.

Abad, G.G., Miller, C.C., O'Sullivan, E., Nowlan, C.R., Wang, H., Sun, K., **Souri, A. H.**, Jung, Y., Villanueva, N., Liu, X. and Chance, K., 2019, December. MEaSUREs project for H_2CO, $C_2H_2O_2$ and H_2O long-term consistent records from GOME to OMI and beyond. AGU Fall Meeting 2019. San Francisco, CA.

Chance K., et al., TEMPO Green Paper: Chemistry, physics, and meteorology experiments with the Tropospheric Emissions: monitoring of pollution instrument, SPIE 11151, Sensors, Systems, and Next-Generation Satellites XXIII, 111510B, 2019. https://doi.org/10.1117/12.2534883.

Souri A.H., H. Wang, G. Gonzalez Abad, X. Liu, and K. Chance, Quantifying the Impact of Evapotranspiration From Crops on an Extreme Heat Wave Event in the Midwestern U.S.: A

Top-down Constraint from Satellites using the Local Ensemble Transform Kalman Filter (LETKF), AMS Joint Satellite Conference, Boston, MA, 2019.

Wang H., **A. H. Souri**, G. Gonzalez Abad, X. Liu, and K. Chance, Total Column Water Vapor product derived from OMI, AMS Joint Satellite Conference, Boston, MA, 2019.

Chance K., X. Liu, G. González Abad, J. Bak, C. Chan Miller, Y. Jung, C. R. Nowlan, **A. H. Souri**, R. M. Suleiman, and H. Wang, North American Pollution Measurements from Geostationary Orbit with Tropospheric Emissions: Monitoring Of Pollution (TEMPO), AMS Joint Satellite Conference, Boston, MA, 2019.

Jung Y., G. González Abad, C. R. Nowlan, **A. H. Souri**, K. Chance, X. Liu, O. Torres, and C. Ahn, A measurement-based explicit aerosol correction for OMI HCHO retrievals, AMS Joint Satellite Conference, Boston, MA, 2019.

Nowlan C. R., G. González Abad, L. Zhu, Y. Jung, K. Chance, **A. H. Souri**, L. Flynn, G. Jaross, and C. Seftor, Formaldehyde Products from the OMPS Nadir Mappers on Suomi-NPP and NOAA-20, AMS Joint Satellite Conference, Boston, MA, 2019

Souri A.H. et al., Response of Hurricane Harvey's Rainfall to Anthropogenic Aerosols, GEOS-Chem Meeting (IGC9), Harvard University, 2019, Cambridge, Massachusetts.

Souri, A.H., Gonzalez Abad, G., Nowlan C. R., Liu X., Chance K., Constraining NOx and NMVOC Emissions using OMPS during KORUS-AQ Campaign and Implications for Ozone Formation, AGU Fall Meeting, Washington, D.C., 2018.

Souri A.H. et al., Response of Hurricane Harvey's Precipitation to Anthropogenic Aerosols, AGU Fall Meeting, 2018, Washington D.C.

- **Souri A.H.,** Response of Hurricane Harvey to Anthropogenic Aerosols, Stars and Planets Seminar, Harvard University, 2018, Cambridge, Massachusetts.

Jung J., Choi Y., **Souri A.H.,** and Jeon W., Data assimilation of GOCI AOD and surface PM observations on aerosol modeling over the Korean Peninsula during KORUS-AQ campaign, EGU, 2018, Vienna, Austria.

Kotsakis A., Choi Y., **Souri A.H.**, Jeon W., and Flynn J., Impacts of Biomass Burning on Free-Tropospheric Ozone Photochemistry over the Southern United States, AMS, 2018, Austin.

- **Souri A.H.,** Constraining NO_x emissions using spaceborne and airborne remotely sensed NO_2 observations. Harvard-Smithsonian Center for Astrophysics, 2017, Cambridge, Massachusetts.

Jeon W., Jung J., Choi Y., **Souri A.H.,** and Long-term variability of wind patterns at hub-height over Texas, AGU, 2017, New Orleans, Louisiana.

Jung J., Choi Y., **Souri A.H.,** and Jeon W., Chemical data assimilation of geostationary aerosol optical depth and PM surface observations on regional aerosol modeling over the Korean Peninsula during KORUS-AQ campaign, AGU, 2017, New Orleans, Louisiana.

Kotsakis A., Choi Y., **Souri A.H.,** Jeon W., and Flynn J. H., Characterization of Wind Patterns over Texas Using Self-Organizing Maps: Impact on Dallas-Fort Worth Long Term Ozone Trends, AGU, 2017, New Orleans, Louisiana.

Choi Y., **Souri A.H.,** Jeon W., Kochanski A., Diao L., Mandel J., Bhave P., and Pan S., The impact of biomass burning emissions on inorganic aerosols and their precursors in the US: A three-year regional modeling evidence, AGU, 2017, New Orleans, Louisiana.

Souri A.H., Choi Y., Pan S., Curci G., Janz S. J., Kowalewski M. G., Liu J., Herman J. R., and Weinheimer A. J., Application of High Resolution Air-Borne Remote Sensing Observations for Monitoring NOx Emissions, AGU, 2017, New Orleans, Louisiana.

Souri A.H., Choi Y., Jeon W., Kochanski A., Diao L., Mandel J., Bhave P., and Pan S., Quantifying the impact of biomass burning on major inorganic aerosols in the US: The role of emissions and water released from biomass, MAC-MAQ, 2017, UC Davis, Sacramento, California

Kotsakis A., Choi Y., Flynn J. H., Erickson M., **Souri A.**, Lefer B., Gary M., Estes M., Westenbarger D., Impact of Synoptic & Global Scale Features on the Year-to year variablity of ozone exceedances in Houston, AMS 18th Conference on Atmospheric Chemistry, January 2013, New Orleans, Louisiana.

Souri, A. H., Inverse modeling using satellite NO_2 measurements, December, 2015, Texas Commission on Environmental Quality, Austin, TX.

Souri, A. H., et al., Nitrogen Oxide Emissions Constrained by Space-based Observations of NO2 column over Southeast Texas, October 2015, Community Modeling and Analysis meeting, Chapel Hill, NC.

Choi, Y., **Souri, A. H.,** Chemical Condition and Surface Ozone in Large Cities of Texas During the Last Decade: Observational Evidence from OMI, CAMS, and Model Analysis, October 2015, Community Modeling and Analysis meeting, Chapel Hill, NC.

Souri, A. H., Mohammadi, A., and Sharifi, M. A.: A New Prompt for Building Extraction in High Resolution Remotely Sensed Imagery, Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XL1/W3, 405-408, doi:10.5194/isprsarchives-XL-1-W3-405-2013, 2013.

Technical Skills

Programming: MATLAB, Python, FORTRAN, Linux Shell

Certifcates: IBM Data Science Professional Certificate

Models: WRF, GEOS-5, CMAQ, GEOS-Chem, WRF-Chem, MEGAN, WRF-SFIRE, WRF-DA (3D and 4D- var), GEOS-Chem TOMAS, HYSPLIT

Highly-skilled in high performance computing systems (HPC): Compiled, setup, configured, ran numerous libraries, models, scripts, and tools at NASA's Discover and Pleiades, Harvard's Odyssey/Cannon, SAO's Hydra, and UofH's Spock, Maxwell, and Opuntia clusters.

Languages: English (proficient), Persian (mother tongue), Arabic (basic knowledge)

Github: https://github.com/ahsouri

Digital Background

Google Scholar: https://scholar.google.com/citations?user=CyNCGRAAAAAJ&hl=en

Owner of ozonerates: www.ozonerates.space

ResearchGate: https://www.researchgate.net/profile/Amir_Hossein_Souri

LinkedIn: https://www.linkedin.com/in/amirhsouri/

Twitter: https://twitter.com/AmirHSouri1

Personal website: https://www.ahsouri.com