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Objective

To develop a career in emissions inventories, climate, air pollution and data science.

Education

Post-Doc in of Atmospheric Sciences, GML/NOAA and CIRES/CU 01/03/2012 – present

- CH₄ posteriori emissions over North America during COVID-19 period.
- HYSPLIT workshop. Development of R package to read and process NOAA GML ObsPack. <https://ibarraespinosa.github.io/robstack/>.

Post-Doc in of Atmospheric Sciences, Nuclear and Energy Research Institute 01/08/2021 – 01/02/2022

- Participation in the METROCLIMA project to estimate priori and posteriori CO₂ fluxes.

Post-Doc in of Atmospheric Sciences, Chinese Academy of Sciences 01/01/2019 – 15/07/2019

- Developing comprehensive vehicle emissions inventories for China.

Post-Doc in Atmospheric Sciences, Universidade de São Paulo (USP) 01/11/2017 – 30/07/2021

- Evaluation of environmental and chemical policies from PETROBRAS on emissions inventories and air quality models. It was used VEIN with WRF-Chem.

PhD in Atmospheric Sciences, Universidade de São Paulo (USP) 01/09/2013 – 30/10/2017

- PhD thesis: Air pollution modeling in São Paulo using bottom-up vehicular emissions inventories <https://teses.usp.br/teses/disponiveis/14/14133/tde-29052018-140319/en.php>.
- Developed the R package VEIN (Vehicular Emissions Inventories) <https://CRAN.R-project.org/package=vein>. VEIN is now used in many countries more than 20000 direct downloads <https://github.com/atmoschem/vein> with Fortran and OpenMP.
- Developed the R package EIXPORT <https://CRAN.R-project.org/package=eixport>, with more than 17000 direct downloads <https://github.com/atmoschem/eixports>.
- Won the Chilean Government's "Becas Chile" Scholarship
- Generated emission inputs and run WRF Chem model.
- Mentored by air pollution and meteorology expert Prof. Rita Ynoue and co-mentored by Prof. María de Fátima Andrade (Universidade de São Paulo), Prof. Edzer Pebesma (University of Munster) and Prof. Mauricio Osses (Universidad Santa Maria).
- Internship TRL Transport Research Lab UK as emissions analyst.
- Course: Numerical Modeling of the Atmosphere: GCM Design and Applications by Carlos Mechoso (UCLA) at IAG/USP.
- Organized internal and external meetings, workshops, and seminars at University of São Paulo.

01/03/2010 – 01/12/2011

Masters in Environmental Planning and Management from the Universidad de Chile, Santiago

- Won the Chilean Government's "Centro Nacional del Medio Ambiente" Scholarship.
- While working as a Emissions Inventories research analyst, graduated with a Masters from the University of Chile
- Master thesis: Identification of Improvements into estimation of vehicular emissions in Santiago, Chile. <http://mgpa.forestaluchile.cl/Tesis/Ibarra%20Sergio.pdf>

15/09/2003 – 22/06/2007

Bachelor in Environmental Science from Universidad Tecnológica Metropolitana, Santiago, Chile

- Majored in Environmental Engineering and Risk Prevention
- Bachelor thesis: "Effects of air pollution on Acute Respiratory Infections of the Emergency Care Service (SAPU) Pudahuel" La Estrella "(2007).
- Diploma in English (2005-2006) and Diploma in Leadership (2005-2006)

Experience

Centro Nacional del Medio Ambiente, Santiago, Chile 01/09/2007 – 30/08/2013

- Worked for five years conducting emissions inventory projects and writing technical reports for Ministry of Environment and Ministry of Energy.
- Estimated emissions at airports in Chile using Emissions Dispersion Modeling Software EDMS.
- Assessed and evaluated European Emission Inventories (CLRTAP), United States (NEI), Australia (NPI), and Japan (JPRTR). Completed literature reviews on international GHG policies and road models (e.g. COPERT, HBEFA)
- Completed GHG emissions inventory projects for the Ministry of Energy, Chile, RM 2010, the Andacollo Municipality 2011, and the Ministry of Environment, Chile, RM 2010.

Skills & Computational Language

- 2022 hysplit workshop (NOAA)
- R (advanced), Fortran (medium), Python (basic), Bash (basic), Latex (medium), Markdown (advanced).
- WRF-Chem, QGIS, VEIN, EIXPORT. Author of 10 R packages.
- Several basic and advanced R and Python courses on Datacamp. Completed:
 - Spatial Analysis with sf and raster in R, Writing Efficient R Code, Python Data Science Toolbox (Part 1), Python Data Science Toolbox (Part 2)
- Currently studying modern Fortran and Fortran Package Manager (fpm).
- COVID-19 Contact Tracing, Johns Hopkins University on coursera.org
- Virtual PAPILA Summer School. Sponsors: The EU PAPILA Project, MAP-AQ (IGAC and WMO) The University of Chile in Santiago and the Max Planck Institute for Meteorology in Hamburg

Languages

Portuguese (fluent); English (advanced); Spanish (fluent). Lived 8 years in Brazil and completed all PhD courses/exams through Portuguese. Advanced English course at the University of Alabama, Tuscaloosa, USA (2007). TOEIC (2007): Oral comprehension 445. Written comprehension 305. TOEFL (2015): Results: 553 in (2007) and 580

Manuscripts under review and preprints

1. Freitas, E.D., **Ibarra-Espinosa, S.A.**, Gavidia-Calderón, M.E., Rehbein, A., Abou Rafee, S.A., Martins, J.A., Santos, L.D., Santos, U.P., Ning, M.F., Andrade, M.F., Trindade, R.I.F. (2020). Mobility Restrictions and Air Quality under COVID-19 Pandemic in São Paulo, Brazil. Preprints 2020, 2020040515 (doi: 10.20944/preprints202004.0515.v1).

Publications with peer review process

1. Tivey, J.; Davies, H.C.; Levine, J.G.; Zietsman, J.; Bartington, S.; **Ibarra-Espinosa, S.**; Ropkins, K. Meta-Analysis as Early Evidence on the Particulate Emissions Impact of EURO VI on Battery Electric Bus Fleet Transitions. Sustainability 2023, 15, 1522. <https://doi.org/10.3390/su15021522>
2. **Ibarra-Espinosa S**, Rehbein A, Dias de Freitas E, Martins LD, Andrade MD, Landulfo E. Changes in a bottom-up vehicular emissions inventory and its impact on air pollution during COVID-19 lockdown in São Paulo, Brazil. *Frontiers in Sustainable Cities*.:104. 10.3389/frsc.2022.883112
3. Rodrigo J. Seguel, Laura Gallardo, Mauricio Osses, Néstor Y. Rojas, Thiago Nogueira, Camilo Menares, Maria de Fatima Andrade, Luis C. Belalcázar, Paula Carrasco, Henk Eskes, Zoë L. Fleming, Nicolas Huneeus, **Sergio Ibarra-Espinosa**, Eduardo Landulfo, Manuel Leiva, Sonia C. Mangones, Fernando G. Morais, Gregori A. Moreira, Nicolás Pantoja, Santiago Parraguez, Jhojan P. Rojas, Roberto Rondanelli, Izabel da Silva Andrade, Richard Toro, Alexandre C. Yoshida; Photochemical sensitivity to emissions and local meteorology in Bogotá, Santiago, and São Paulo: An analysis of the initial COVID-19 lockdowns. *Elementa: Science of the Anthropocene* 4 January 2022; 10 (1): 00044. doi: <https://doi.org/10.1525/elementa.2021.00044>
4. **Ibarra-Espinosa, S.**, Freitas, E. D. D., Andrade, M. D. F., & Landulfo, E. (2022). Effects of Evaporative Emissions Control Measurements on Ozone Concentrations in Brazil. *Atmosphere*, 13(1), 82.
5. **Ibarra-Espinosa, S.**, da Silva, G. A. M., Rehbein, A., Vara-Vela, A., & de Freitas, E. D. (2022). Atmospheric effects of air pollution during dry and wet periods in São Paulo. *Environmental Science: Atmospheres*.
6. **Ibarra-Espinosa, S.**, Mera, Z., Rosero, R., & Díaz, M. V. (2021, November). Spatial and temporal characterization of vehicular emissions in Ecuador using VEIN. In 2021 Congreso Colombiano y Conferencia Internacional de Calidad de Aire y Salud Pública (CASAP) (pp. 1-5). IEEE.
7. **Ibarra-Espinosa S**, Dias de Freitas E, Ropkins K, Dominici F, Rehbein A. Negative-Binomial and quasi-poisson regressions between COVID-19, mobility and environment in São Paulo, Brazil. *Environ Res.* 2022 Mar;204(Pt D):112369. doi: 10.1016/j.envres.2021.112369. Epub 2021 Nov 9. PMID: 34767818; PMCID: PMC8577054.
8. Ranjeet S. Sokhi, Vikas Singh, Xavier Querol, Sandro Finardi, Admir Créso Targino, Maria de Fatima Andrade, Radenko

- Pavlovic, Rebecca M. Garland, Jordi Massagué, Shaofei Kong, Alexander Baklanov, Lu Ren, Oksana Tarasova, Greg Carmichael, Vincent-Henri Peuch, Patricia Camacho Rodriguez, Vrinda Anand, Graciela Arbillá, Kaitlin Badali, Gufran Beig, Luis Carlos Belalcazar, Andrea Bolignano, Peter Brimblecombe, Alejandro Casallas, Jean-Pierre Charland, Jason Choi, Eleftherios Chourdakis, Isabelle Coll, Marty Collins, Josef Cyrus, Cleyton Martins da Silva, Alessandro Domenico Di Giosa, Anna Di Leo, Camilo Ferro, Mario Gavidia, Amiya Gayen, Alexander Ginzburg, Fabrice Godefroy, Yuri Alexandra Gonzalez, Marco Guevara-Luna, Sk. Mafizul Haque, Henno Havenga, Monica Jaimés-Palomera, Dennis Herod, Urmas Hõrrak, Tareq Hussein, **Sergio Ibarra**, Marko Kaasik, Ravindra Khaiwal, Jhoon Kim, Anu Kousa, Jaakko Kukkonen, Markku Kulmala, Joel Kuula, Nathalie La Violette, Guido Lanzani, Xi Liu, Stephanie MacDougall, Patrick M. Manseau, Giada Marchegiani, Brian C. McDonald, Rajasree VP Meethal, Swasti Vardhan Mishra, Luisa T. Molina, Dennis Mooibroek, Suman Mor, Nicolas Moussiopoulos, Fabio Murena, Jarkko V. Niemi, Steffen Noe, Thiago Nogueira, Michael Norman, Olivia Rivera Hernandez, Juan Luis Pérez-Camaño, Tuukka Petäjä, Stuart Piketh, Aditi Rathod, Ken Reid, Armando Retama, Antonio Terrazas-Ahumada, Néstor Y. Rojas, Jhojan P. Rojas, Roberto San José, Odón Sánchez, Rodrigo J. Seguel, Salla Sillanpää, Yushan Su, Nigel Tapper, Hilka Timonen, Domenico Toscano, George Tsegas, Guus J. M. Velders, Christos Vlachokostas, Erika von Schneidmesser, Ravi Yadav, Rasa Zalakeviciute and Miguel Zavala. (2021). A global observational analysis to understand changes in air quality during exceptionally low anthropogenic emission conditions. *Environment International*. *Accepted*
9. Nogueira, T., Kamigauti. L., Pereira, G., Gavidia-Calderon, M., **Ibarra-Espinosa, S.**, Oliveira, G., Miranda, R., Vasconcellos, P., Freitas, E., Andrade. M. (2021). Evolution of Vehicle Emission Factors in a Megacity Affected by Extensive Biofuel Use: Results of Tunnel Measurements in São Paulo, Brazil. *Environmental Science & Technology*, Accepted, 2021.
 10. Gavidia-Calderón, M. E., **Ibarra-Espinosa, S.**, Kim, Y., Zhang, Y., and Andrade, M. D. F.: Simulation of O₃ and NO_x in Sao Paulo street urban canyons with VEIN (v0.2.2) and MUNICH (v1.0). (202a). *Geosci. Model Dev. Discuss.* [preprint], <https://doi.org/10.5194/gmd-2020-282>, Accepted, 2021.
 11. **Ibarra-Espinosa, S.**, Zhang, X., Xiu, A., Gao, C., Wang, S., Ba, Q., Gao C. and Chen, W. (2021). A comprehensive spatial and temporal vehicular emissions for northeast China. *Atmospheric Environment*, 244, 117952.
 12. Bolaño-Ortiz, T. R., Camargo-Caicedo, Y., Puliafito, S. E., Ruggeri, M. F., Bolaño-Díaz, S., Pascual-Flores, R., Saturno J., **Ibarra-Espinosa S.**, Mayol-Bracero O., Torres-Delgado E. and Cereceda-Balic, F. (2020). Spread of SARS-CoV-2 through Latin America and the Caribbean region: a look from its economic conditions, climate and air pollution indicators. *Environmental research*, 191, 109938.
 13. Pinto, J. A., Kumar, P., Alonso, M. F., Andreão, W. L., Pedruzzi, R., **Ibarra-Espinosa, S.**, Maciel F. and de Almeida Albuquerque, T. T. (2020). Coupled models using radar network database to assess vehicular emissions in current and future scenarios. *Science of The Total Environment*, 143207.
 14. Freitas, E.D., M.F. Andrade, **Ibarra-Espinosa, S.A.**, Gavidia-Calderón. (2020). Redução nas concentrações de poluentes durante o surto de COVID-19 na Cidade de São Paulo. *Diálogos socioambientais na macrometrópole paulista*. URL <https://periodicos.ufabc.edu.br/index.php/dialogossocioambientais/issue/view/20>. ISSN 2596-2183
 15. **Ibarra-Espinosa, S.**, Ynoue, R. Y., Ropkins, K., Zhang, X., & de Freitas, E. D. (2020). High spatial and temporal resolution vehicular emissions in south-east Brazil with traffic data from real-time GPS and travel demand models. *Atmospheric Environment*, 222, 117136.
 16. **Ibarra-Espinosa, S.**, Ynoue, R., Giannotti, M., Ropkins, K., & de Freitas, E. D. (2019). Generating traffic flow and speed regional model data using internet GPS vehicle records. *MethodsX*, 6, 2065-2075.
 17. Pinto, J. A., Kumar, P., Alonso, M. F., Andreão, W. L., Pedruzzi, R., **Espinosa, S. I.**, & de Almeida Albuquerque, T. T. (2020). Kriging method application and traffic behavior profiles from local radar network database: A proposal to support traffic solutions and air pollution control strategies. *Sustainable Cities and Society*, 102062.
 18. Ma S, Zhang X, Gao C, Tong DQ, Xiu A, Wu G, Cao X, Huang L, Zhao H, Zhang S, **Ibarra-Espinosa S**, Wang X, Li X, Mo D. Multimodel simulations of a springtime dust storm over northeastern china: Implications of an evaluation of four commonly used air quality models (CMAQ v5.2.1, CAMx v6.5.0, CHIMERE v2017r4, and WRF-chem v3.9.1). *Geoscientific Model Development* 2019,12(11):4603-25.
 19. Rehbein, A, Ambrizzi, T, Mechoso, CR, **Espinosa, SAI**, Myers, TA. Mesoscale convective systems over the Amazon basin: The GoAmazon2014/5 program. *Int J Climatol*. 2019, 1– 20. <https://doi.org/10.1002/joc.6173>.
 20. Schuch, D., de Freitas, E. D., **Espinosa, S. I.**, Martins, L. D., Carvalho, V. S. B., Ramin, B. F., ... & de Fatima Andrade, M. (2019). A two decades study on ozone variability and trend over the main urban areas of the São Paulo state, Brazil. *Environmental Science and Pollution Research*, 26(31), 31699-31716.
 21. Chiquetto, J. B., Ynoue, R. Y., **Ibarra-Espinosa, S. A.**, Ribeiro, F. N. D., Cabral-Miranda, W., & Silva, M. E. S. (2020). Ozone Pollution and Urban Mobility Scenarios in the São Paulo Megacity. *Ambiente & Sociedade*, 23.
 22. Chiquetto, J.B., Silva, M.E.S., Cabral-Miranda, W., Ribeiro, F.N.D., **Ibarra-Espinosa, S.A.**, Ynoue, R.Y. Air Quality Standards and Extreme Ozone Events in the São Paulo Megacity. *Sustainability* 2019, 11, 3725.
 23. **Ibarra-Espinosa, S.**, Ynoue, R., O'Sullivan, S., Pebesma, E., Andrade, M. D. F., and Osses, M.: VEIN v0.2.2: an R package for bottom-up vehicular emissions inventories, *Geosci. Model Dev.*, 11, 2209-2229, <https://doi.org/10.5194/gmd-11-2209-2018>, 2018.
 24. **Ibarra-Espinosa S.**, Schuch D., Dias de Freitas E. (2018). eixport: An R package to export emissions to atmospheric models. *Journal of Open Source Software*, 3(24), 607, <https://doi.org/10.21105/joss.00607>
 25. Schuch D. **Ibarra-Espinosa S.**, Dias de Freitas E. (2018). EmissV: an R package to create vehicular and other emissions for air quality models. *Journal of Open Source Software*, 3(30), 662, <https://doi.org/10.21105/joss.00662>
 26. Schuch, D., **Ibarra-Espinosa, S.**, de Freitas, E. D., and de Fatima Andrade, M. (2018a). Emissv: a preprocessor for wrf-chem model. *Journal of Atmospheric Science Research*, 1(2):35–45.
 27. **Ibarra S.**, Ynoue R. (2017). REMI model: Bottom - up emissions inventories for cities with lack of data. *Journal of earth*

sciences and geotechnical engineering.

28. Andrade MF, Ynoue R., Freitas E., Todezco E., Vara-Vela A., **Ibarra S**, Martins L., Martins J and Carvalho V. (2015). Air quality forecasting system for southeastern Brazil. *Frontiers in Environmental Science*.
29. Santibañez D., **Ibarra S.**, Matus P., Seguel R. y Leiva M. (2011). Particulate matter (PM_{2.5}) and cerebrovascular diseases in Santiago de Chile. *Environmental Pollution*.
30. Abrutzky R., **Ibarra S.**, Matus P., Romero-Lankao P., Pereyra V. (2013). Atmospheric pollution and mortality. A comparative study between two Latin American cities: Buenos Aires (Argentina) and Santiago (Chile). *International journal of environment and Health*.

Conferences

1. Ibarra-Espinosa S., Hu L., 2023-5-16: robspack, a fast R package to read, process and plot NOAA/GML ObsPack. CIRES 18th Annual Rendezvous / University of Colorado, Boulder, CO, United States
https://insidecires.colorado.edu/rendezvous/uploads/Rendezvous_2023_8491_1683824801.pdf
2. Ibarra-Espinosa S., Hu L., 2023-5-23: robspack, a fast R package to read, process and plot NOAA/GML ObsPack.. 51st Global Monitoring Annual Conference (GMAC) NOAA GML, Boulder, CO, United States
<https://gml.noaa.gov/annualconference/agenda.php?day=2023-05-23&type=poster>
3. Hu, L., Andrews, A., Montzka, S., Dlugokencky, E., Miller, S., **Ibarra-Espinosa, S.**, Sweeney, C., Bruhwiler, L., Miles, N., and Davis, K.: Trend and seasonal cycle of US methane emissions, EGU General Assembly 2023, Vienna, Austria, 24–28 Apr 2023, EGU23-10367, <https://doi.org/10.5194/egusphere-egu23-10367>, 2023.
4. **Ibarra-Espinosa S**, Hu, L., Dlugokencky, E., McKain, K., Miller, S., Sweeney, C., Andrews, A. (2022). Quantification of the COVID-19 impact on US methane emissions. Conference: AMS, At: Denver, USA
5. **Ibarra-Espinosa S**, Hu, L., Dlugokencky, E., McKain, K., Miller, S., Sweeney, C., Andrews, A. (2022). Quantification of the COVID-19 impact on US methane emissions. Conference: AGU Fall meeting 2022 At: Chicago, USA
6. **Ibarra-Espinosa S**, Emmons, L., Lichtig, P., Brasseur, G. (2022). Air pollution simulation in South America using the Multi-Scale Infrastructure for Chemistry and Aerosols (MUSICA) model. Conference: AGU Fall meeting 2022 At: Chicago, USA
7. **Ibarra-Espinosa S**, Mera Z., Rosero R., Diaz M. (2021). Spatial and temporal characterization of vehicular emissions in Ecuador using VEIN. Conference: VIII Colombian Congress and International Conference on Air Quality and Public Health - CASAP 2021. <https://ieeexplore.ieee.org/xpl/conhome/9703325/proceeding>
8. **Ibarra-Espinosa S**, Freitas ED. (2021). Association between COVID-19, mobility and environment in Brazilian capitals. Conference: 2021 Annual Meeting of the European Meteorological Society – European Conference for Applied Meteorology and Climatology At: online. DOI: 10.5194/ems2021-110
9. **Ibarra-Espinosa S**, Silva, G., Rehbein, A., Vara-Vela, A. Freitas, ED. (2021). Direct and indirect effects of aerosols on meteorology and air pollutant concentrations during dry and wet periods on Southeast Brazil. Conference: 16th IGAC Scientific Conference, Atmospheric Chemistry from a Distance: Real Progress through Virtual Interaction 2021 DOI: 10.13140/RG.2.2.35951.76965
10. **Ibarra-Espinosa S**, Freitas ED. (2020). Increment of O₃ During Lockdown Related To Spatial-Temporal Variability Of VOC/NO₂ Emissions-Ratio In São Paulo, Brazil. Conference: AGU Fall meeting 2020 At: Online.
11. Freitas ED, **Ibarra-Espinosa S**, (2020). New phases of PROCONVE: Can the new limits really bring an improvement to Air Quality? Conference: Brazilian Society of Automotive Engineering - SIMEA 2020 At: Online.
12. **Ibarra-Espinosa S**, Freitas ED. The VEIN model to compile multiscale vehicular emissions inventories. Conference: 19 GEIA Conference - The Global Emissions Initiative and Accelerating Social Transformations. Santiago, Chile.
13. **Ibarra-Espinosa S**, Andrade, Martins L. Vehicular emissions in Brazil between 2007 and 2017. CMAS Conference, Minas Gerais, Brasil, July 2019.
14. Ynoue R., **Ibarra-Espinosa S**. Modeling vehicular emissions at São Paulo. CMAS Conference, Minas Gerais, Brasil, July 2019.
15. **Ibarra-Espinosa S**, Zhang X, Aijun X, Dias de Freitas E. High spatial resolution vehicular emissions inventory for China using VEIN model. Japan Geoscience Union (JPGU) meeting, Chiba, Japan from May 26 th to 30 th, 2019.
16. Chiquetto, J, Ynoue R., **Ibarra S.**, Riberiro F., Cabral-Miranda W., Siqueira Silva M. 2018. “Driving Restriction Policies in São Paulo Simulation and Impacts on Ozone Air Quality in its Metropolitan Area.” In 2018 1o ANPPAS Sudeste - Sustentabilidade e Interdisciplinaridade At: EACH/USP, São Paulo Volume: ISBN 9788564842458
17. **Ibarra-Espinosa, Sergio**, Edmilson Dias de Freitas. 2018. “Parallelizing the Vehicular Emissions Inventory model (VEIN) with Foreach Parallel Adaptor doMC.” In 2018 I GPU computing workshop, Instituto de Física, São Paulo, Brazil.
18. **Ibarra-Espinosa, Sergio**, Edmilson Freitas, Rita Ynoue, Maria de Fátima Andrade, and Daniel Schuch. 2018. “Towards a Vectorial Global Vehicular Emissions Inventory.” In 2018 Joint 14th iCACGP Quadrennial Symposium/15th Igac Science Conference, Takamatsu, Japan.
19. **Ibarra-Espinosa, Sergio**. (2018). O programa VEIN: mapeamento de emissões veiculares em condições de trafego urbano real. IV Simpósio de Eficiência Energética: Emissões e Combustíveis. Associação Brasileira de Engenharia Automotiva. São Paulo | Brazil| 14 June 2018.
20. **Sergio Ibarra**, Rita Ynoue, Mariana Giannotti, Maria de Fatima Andrade, Edmilson Freitas, and Daniel Schuch. (2018). Using Internet GPS traffic data for vehicular emissions inventories and air pollution modeling. European Geosciences Union General Assembly Vienna | Austria | 8–13 April 2018.
21. **Sergio Ibarra**, Rita Ynoue, Maria de Fátima Andrade, and Edmilson Freitas. (2018). Recent development and perspectives of the VEIN model. European Geosciences Union General Assembly 2018 Vienna | Austria | 8–13 April 2018.

22. **Sergio Ibarra-Espinosa**, Daniel Schuch, Rita Ynoue, and Edmilson Freitas,. (2018). VEIN, EmissV and eixport R packages for multiscale emissions inventories. European Geosciences Union General Assembly 2018 Vienna | Austria | 8–13 April 2018.
23. Chiquetto J., Ynoue R., **Ibarra-Espinosa S.**, Ribeiro F.N.D., Cabral-Miranda W., Silva M. (2018). Driving Restriction Policies in São Paulo Simulation and Impacts on Ozone Air Quality in its Metropolitan Area. 1o ANPPAS Sudeste - Sustentabilidade e InterdisciplinaridadeAt: EACH/USP, São Paulo Volume: ISBN 9788564842458.
24. **Ibarra-Espinosa S.**, Ynoue R., and Andrade MF. (2017). High Resolution vehicular emissions inventory in Shanghai China: Application of VEIN model. Japan Geoscience Union (JPGU) meeting, Chiba, Japan from May 20 th to 25 th , 2017.
25. **Ibarra-Espinosa S.**, Ynoue R. 2017. Strategies to cut vehicular gree house emissions. São Paulo School of Advanced Science on Climate Change: Scientific basis, adaptation, vulnerability and mitigation. Instituto de Astronomia, Geofísica e Ciências Atmosféricas. Universidade de São Paulo, 03-15 July 2017, São Paulo, Brazil.
26. **Ibarra S.** and Ynoue R. (2016). REMI model: Bottom-up emissions inventories for cities with lack of data. 21 International Transport and Air Pollution Conference “TAP 2016”. Lyon, France from May 24 th to 26 th , 2016.
27. **Ibarra S.**, Vara-Vela A., Rehbein A., Ynoue R. (2015). High resolution air pollutant simulation for the Metropolitan Region of Porto Alegre. In: IX Workshop Brasileiro de Micrometeorologia, 2015, Santa Maria.
28. **Ibarra S.**, Vara-Vela A., Rehbein A. (2015). Analyzing Ippc Global Climate Models With Rwbclimate In Southamerica. In: Mudanças Climáticas em São Paulo: Causas, Impactos e Soluções, 2015, São Paulo, Brazil.
29. **Ibarra S.**, Vara-Vela A., Ynoue R. (2015). Vehicular buttom-up emissions inventory and atmospheric simulation for 58 urban centers of South America. In: 11th International Conference on Southern Hemisphere Meteorology and Oceanography, 2015, Santiago.
30. **Ibarra S.**, Ynoue R. and Vara-Vela A. (2014). Development and evaluation of a vehicular emissions inventory based in traffic counts for Metropolitan Region of São Paulo. Joint 13th IGAC Science Conference and 13th Quadrennial iCACGP Symposium held at Natal Convention Center (NCC), Natal, Brazil, from September 22 to 26, 2014.
31. **Ibarra-Espinosa, S.**, Prendez M. (2013) Aplicación Del Enfoque De Situación De Tráfico En La Estimación De Emisiones Vehiculares En Santiago. VIII Jornadas Chilenas de Física y Química Ambiental, Punta Tralca..
32. **Ibarra, S.**, Campos, D., Abrutzky, R., Cortés, C., Matus, P., Davidowski, D. and Amin, M. (2012) Pronóstico de CO y NOx con varias técnicas estadísticas en Buenos Aires, in dos Santos Alfonso, M. and Torres Sánchez, R.M. (Eds.): Ciencia y Tecnología Ambiental. Un enfoque integrador, Asociación Argentina para al Progreso de las Ciencias, Buenos Aires.
33. **Ibarra S.** y Salim J. (2011). Estimación de las emisiones de carreteras de la Región Metropolitana aplicando metodologías Copert III y IV. Estudio presentado en VII Jornadas Chilenas de Física y Química Ambiental, Universidad Católica de la Santísima Concepción, Julio 2011, Concepción, Chile.
34. **Ibarra S.** González-Barrientos J y Salim J. (2011). Influencia del césped en la estimación de material particulado resuspendido de calles. Estudio presentado en VII Jornadas Chilenas de Física y Química Ambiental, Universidad Católica de la Santísima Concepción, Julio 2011, Concepción, Chile.
35. **Ibarra S.**, Donoso C., Gutiérrez L., Mera E., Leiva M. (2009). Partículas Ultrafinas y su efecto en la salud: oportunidades y desafíos. Estudio presentado en Primer Congreso de Nano-tecnología, Universidad Técnica Federico Santa María, Mayo 2009, Valparaíso Chile.
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37. **Ibarra S.**, Matus P., Gutiérrez L., y Mera E. (2009). Efectos de contaminantes atmosféricos en enfermedades respiratorias de mayores de 65 años en Pudahuel. Estudio de series con interacción ozono-temperatura. V Congreso Latinoamericano de Física y Química Ambiental, Sociedad de Química Ambiental de Chile, Octubre 2009, Arica, Chile.
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39. **Ibarra S.**, Mera E., Da Silva L. (2008). Material Particulado MP2.5 e Infecciones Respiratorias Agudas. Estudio presentado en XVI Simposio Chileno de Física, Universidad Técnica Federico Santa María, Noviembre 2008, Valparaíso Chile.

Books

1. Ropkins K., **Ibarra-Espinosa S.A.**, Bernard, Y. 2020. Vehicle Emissions Measurement and Modeling in: Khreis H., Nieuwenhuijsen M., Zietsman J., Ramani T. Traffic-Related Air Pollution. 1 edition. ISBN: 9780128181225. Elsevier. <https://www.elsevier.com/books/traffic-related-air-pollution/khreis/978-0-12-818122-5>
2. Ibarra-Espinosa, Sergio. 2018. “VEINBOOK: Estimating vehicular emissions with the R package VEIN”. Self-published book on AMAZON:, Paperback, <https://www.amazon.com/dp/1791571158>, Kindle: <https://www.amazon.com/dp/B07L7XRFKC>, ISBN-13: 978-1791571153, ISBN-10: 1791571158.

Software

1. **Sergio Ibarra-Espinosa** (2020). *vein*: Vehicular Emissions Inventories. R package version 0.9.1.1. <https://atmoschem.github.io/vein> and <https://CRAN.R-project.org/package=vein>.
2. **Sergio Ibarra-Espinosa**, Daniel Schuch and Edmilson Dias de Freitas (2018). *eixport*: Export Emissions to Atmospheric

- Models. R package version 0.5.0. <https://atmoschem.github.io/eixport> and <https://CRAN.R-project.org/package=eixport>.
3. **Sergio Ibarra-Espinosa** (2021). *respeciate*: Speciation profiles for gases and aerosol. R package version 0.1.0. <https://github.com/atmoschem/respeciate>. (port US/EPA speciate 5.0 to R)
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 5. **Sergio Ibarra-Espinosa** and Amanda Rehbein (2018). *ratmos*: Tools for handle and plot output of earth models. R package version 0.1.3. <https://github.com/ibarraespinosa/ratmos/>.
 6. Daniel Schuch and **Sergio Ibarra-Espinosa** (2018). *EmissV*: Vehicular Emissions by Top-Down Methods. R package version 0.664.5. <https://CRAN.R-project.org/package=EmissV>.
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 9. **Sergio Ibarra-Espinosa** (2020). *geofabrik*: Downloading Open Street Map Data. R package version 0.1.0. <https://CRAN.R-project.org/package=geofabrik>
 10. **Sergio Ibarra-Espinosa** (2020). *emep*: EMEP EEA Emission factors data-base. R package version 0.1.0. <https://gitlab.com/ibarraespinosa/emep>.
 11. **Sergio Ibarra-Espinosa** (2021). *fem*: Fixed emissions model. R package version 0.1.0. <https://github.com/atmoschem/fem>.

Media and Press

1. Ibarra-Espinosa S., Rehbein A., Freitas ED. (2021). Indicadores de poluição e mobilidade ajudam a prever aumento de casos e mortes por COVID-19 em São Paulo. <https://agencia.fapesp.br/indicadores-de-poluicao-e-mobilidade-ajudam-a-prever-aumento-de-casos-e-mortes-por-covid-19-em-sao-paulo/35539/>
2. Ibarra-Espinosa S. (2018). Software calcula emissões de poluentes por veículo, via e horário. *Jornal da USP*. <https://jornal.usp.br/ciencias/ciencias-ambientais/software-calcula-emissoes-de-poluentes-por-veiculo-via-e-horario/>
3. Ibarra-Espinosa S. (2018). Sistema mede poluição do ar 'rua por rua' em São Paulo. *BBC NEWS Brasil*. <https://www.bbc.com/portuguese/brasil-44459485>.
4. Ibarra-Espinosa S. (2018). Sistema mede poluição do ar 'rua por rua' em São Paulo. *TERRA* <https://www.terra.com.br/noticias/brasil/sistema-mede-poluicao-do-ar-rua-por-rua-em-sao-paulo,ed1c06f9efd4df1ea9ee56b6ae295bb1qdevdzipd.html>
5. Ibarra-Espinosa S. (2018). Sistema mede poluição do ar 'rua por rua' em São Paulo. *UOL*. <https://noticias.uol.com.br/ultimas-noticias/bbc/2018/06/12/sistema-mede-poluicao-do-ar-rua-por-rua-em-sao-paulo.htm>.
6. Ibarra-Espinosa (2018). Software facilita realização de inventário de emissões veiculares. *Diário Oficial*. http://diariooficial.imprensaoficial.com.br/nav_v4/index.asp?c=5&e=20180628&p=1

Teaching

1. YOUTUBE CHANNEL https://www.youtube.com/channel/UC2oYaS9mpnIDk8w55O8_bTg
2. Course VEIN on the Colombian Conference on Air Quality (CASAP VIII), 5 hours. <https://www.casap.com.co/en/pre-congress-courses/>
3. 27-02-2020: Universidade de São Paulo (USP). Curso sobre VEIN. <https://www.iag.usp.br/atmosfericas/vein>.
4. 16-08-2018: Universidade de São Paulo (USP). Curso de R para meteorología IAG/USP. <https://iagdevs.github.io/cursoR/>.
5. 19-03-2018: Universidade Federal de São Paulo (UNIFESP). Environmental Engineering- 'Controle de Poluição Atmosférica'. Class: 'Estimativas de fontes fixas/móveis e inventários'. Professor Dr. Gyrlene Silva.
6. 27-11-2017 to 1-12-2017 'O modelo VEIN' in Departamento de Engenharia Sanitária e Ambiental (DESA), Universidade Federal de Minas Gerais, Grupo de Poluição do Ar e Meteorologia Aplicada (GPAMA), Prof. Dr. Taciana Albuquerque.

Awards

- Best PhD 2018 in Atmospheric Sciences. Destaque Doutorado Meteorologia Sergio Alejandro Ibarra Espinosa. Departamento de Ciências Atmosféricas Instituto de Astronomia, Geofísica e Ciências Atmosféricas, Universidade de São Paulo
- PhD Scholarship from Chilean Government: "Becas Chile"
- Master Scholarship from "Centro Nacional del Medio Ambiente" Scholarship.
- Travel grant from organization to the 2017 Japan Geoscience Union (JPGU) meeting, Chiba, Japan.
- Travel grant from IAG/USP to European Geosciences Union General Assembly Vienna | Austria 2018.
- Travel Grant from organization to 11th International Conference on Southern Hemisphere Meteorology and

Oceanography, 2015, Santiago.

- Travel grant from organization 2018 Joint 14th iCACGP Quadrennial Symposium IGAC.

Extension

- Organizer in program Pathways to Steam of CIRS Colorado University. This program consists in introducing science to CITRUS community college students from California. The program 20023 considers visits to NOAA, CU, and applied research and measurements.
- Classes for elderly people at the Universidade de Sao Paulo,
 1. 24/06/2020 - 13:00. “Meteorologia para a Terceira Idade: Como meu carro afeta a qualidade do ar que respiramos?” <https://www.iag.usp.br/evento/meteorologia-terceira-idade-ibarra-como-meu-carro-afeta-qualidade-ar>
 2. 28/09/2016 - 13:00. “Associação entre COVID-19, fatores ambientais e distanciamento social (USP 60+)” <https://www.iag.usp.br/evento/usp60-ibarra-covid-19-fatores-ambientais>
 3. 29/09/2021 - 13:00. “Efeitos diretos e indiretos dos aerossóis na meteorologia e nas concentrações de poluentes atmosféricos durante os períodos de seca e chuva no Sudeste do Brasil (USP 60+)” <https://www.iag.usp.br/evento/usp60-ibarra-efeitos-aerossóis-meteorologia-poluentes-seca-chuva>
- Participation representing Departamento de Ciências Atmosféricas at the Virada Científica, Universidade de Sao Paulo.
- Talk for IAG Science Day,
 1. 2016: Universidade de Sao Paulo: “Que, como e quanta poluição do ar gera a nossa cidade?” <https://www.iag.usp.br/evento/iag-science-day>
 2. 2018: Universidade de Sao Paulo: “R packages for air pollution studies” <https://www.iag.usp.br/evento/scienceday2018>
 3. 2019: Universidade de Sao Paulo: “Towards a real-time vehicular emissions inventory” <https://www.iag.usp.br/evento/scienceday-2019>
 4. 2020: Universidade de Sao Paulo: “How the COVID-19 restrictions impacted vehicular emissions and air quality in São Paulo” <https://www.iag.usp.br/evento/scienceday-2020>
 5. 2021: Universidade de Sao Paulo: “Comprehensive emissions inventory for Brasil with monthly resolution, 1990-2020” <https://www.iag.usp.br/scienceday>

Selected Invited Talks

- Harvard University, invited by Dr. Francesca Dominici: “Association between COVID-19 and residential mobility index in Sao Paulo, Brazil
- Universidad Nacional Tecnológica de Lima Sur invited by Dr. Odon Sanchez: “VEIN v0.9: an R package for bottom-up vehicular emissions inventories”
- George Mason University invited by Dr. Daniel Tong: “Air pollution modelling with VEIN and other r-packages.”
- CETESB invited by Marcelo Bales ‘Modelagem da poluição atmosférica em São Paulo utilizando inventários de emissões veiculares bottom-up’ <https://cetesb.sp.gov.br/escolasuperior/palestra-modelagem-da-poluicao-atmosferica-em-sao-paulo-utilizando-inventarios-de-emissoes-veiculares-bottom-up/>.
- Ibarra-Espinosa, S. (2023-6-27) Modelo de inventario de emisiones vehiculares Universidad Nacional Tecnologica de Lima Sur. Lima, Peru. <https://www.youtube.com/watch?v=vT8OX8ewCTw>